

Product catalogue

Products for plant- and process-engineering
Automatic valves, actuators and accessories



MORE THAN

40
years

bar

A WATTS Brand

The heart of your valve motion!

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Chapter 1

This is bar GmbH.

Unser Unternehmen

Our company



Seit 1979 ist die bar GmbH mit der Entwicklung, Produktion und dem weltweiten Vertrieb von Armaturen, pneumatischen und elektrischen Schwenkantrieben sowie vielfältigem Zubehör ein bedeutender und zuverlässiger Partner vieler namhafter Industrieunternehmen.

bar GmbH ist einer der technologischen Vorreiter im Bereich der Armaturen-Automatisierung. Produkte kontinuierlich an neueste Normen und Kundenanforderungen anzupassen ist der Anspruch, mit dem wir stetig an Produktinnovationen für den Anlagenbau und die Verfahrenstechnik arbeiten.

Die besondere Kompetenz des Unternehmens liegt dabei in der Entwicklung von kundenspezifischen System- und Sonderlösungen, die mit unserer branchenübergreifenden Erfahrung unter dem Aspekt hoher Wirtschaftlichkeit realisiert werden.

Die ständige Qualitätskontrolle der Produkte und internen Abläufe wird bereits seit vielen Jahren über ein nach DIN EN ISO 9001:2015 zertifiziertes Qualitätsmanagement-System bestätigt. Darüber hinaus ist das Produktportfolio nach EAC zertifiziert.

Basierend auf intensivem Lieferantenmanagement in Kombination mit einer großzügigen Lagerhaltung gewährleisten wir unseren Kunden kurze Lieferzeiten.

Mit unseren gut ausgebildeten und ständig weiterqualifizierten Mitarbeitern realisieren wir kurze Reaktionszeiten sowohl im Tages- als auch im Projektgeschäft..

Überzeugen Sie sich von unserer Leistungsfähigkeit, wir werden Ihre Erwartungen mehr als erfüllen!

Since 1979, with the development, production and world-wide distribution of valves, pneumatic and electrical quarter-turn actuators, as well as diverse accessories, bar GmbH has been a major and dependable partner for many well-known industrial companies.

bar GmbH is one of the technological pioneers in the area of valve automation. Continually adapting products to the newest standards and to customer requirements is a demand which we constantly work with to achieve product innovation for plant construction and process technology.

The particular competence of the company lays thereby in the development of customer-specific systems and specialized solutions which are implemented using our sector-spanning experience while keeping high efficiency in mind.

Constant quality control of the products and internal flows have already been carried out for many years using a DIN EN ISO 9001:2015 certified quality management system. Moreover, the product portfolio is EAC certified.

Using intensive supplier management along with large-scale warehousing, we can ensure our customers short delivery times.

Our staff is well-trained and constantly improving their qualifications, which helps us to maintain short reaction times in our day-to-day and project business.

Experience our efficiency for yourself, we will more than fulfill your expectations!

Automatik-Armaturen

Automatic valves



Der Produktbereich Armaturen umfasst ein komplettes Portfolio an Dreharmaturen für die Verwendung in verfahrenstechnischen Anlagen. Wir legen höchsten Wert auf den Einsatz qualitativ hochwertiger Werkstoffe sowie modernster Fertigungsmethoden. In Kombination mit unseren bewährten betrieblichen Prozessen gewährleisten wir ein ausgezeichnetes Preis-Leistungsverhältnis.

Wir bieten:

- ▶ Kugelhähne handbetätigt, pneumatisch oder elektrisch automatisiert
 - Edelstahl, 3-teilig mit Innengewinden oder Anschweißenden, DN15-100
 - Edelstahl, 1-teilig in Kompaktflanschausführung, DN15-100
 - Edelstahl, 2-teilig mit Innengewinden, DN15-50
 - Edelstahl, 3-Wege-Ausführung mit Innengewinden, DN15-50
 - Messing, 2-teilig mit Innengewinden, DN15-80
 - Messing, 3-Wege-Ausführung mit Innengewinden, DN15-50
- ▶ Absperrklappen handbetätigt, pneumatisch oder elektrisch automatisiert
 - Zwischenflanschausführung, DN40-1200
 - Anflanschausführung, DN40-600
 - Gehäusewerkstoffe: GG25, GGG40, Stahl, Edelstahl
 - Scheibenwerkstoffe: Edelstahl, GGG40 mit diversen Beschichtungen
 - Dichtungsmaterialien: EPDM, NBR, FKM, PTFE, Silikon
 - Zulassung DVGW Wasser + Gas, DNV, Lloyd's Register

Über unser Standard-Lieferprogramm hinaus entwickeln wir gerne in enger Abstimmung mit Ihren Spezialisten die maßgeschneiderte Lösung zu Ihrer besonderen Anwendung.

The Valves product range comprises a complete portfolio of rotary valves for use in process control systems. We attach great importance to the application of highest quality materials, as well as the most modern production methods. In combination with our tried and tested operational processes, we ensure an excellent price/performance ratio.

We offer:

- ▶ Manually-operated ball valves, pneumatically or electrically automated
 - Stainless steel, three-piece with internal threads or welding ends, DN15-100
 - Stainless steel, one-piece in a compact flange design, DN15-100
 - Stainless steel, two-piece with internal thread, DN15-50
 - Stainless steel, 3-way design with internal thread, DN15-50
 - Brass, 2-piece with internal thread, DN15-80
 - Brass, 3-way design with internal thread, DN15-50
- ▶ Butterfly valves, manually-operated pneumatically or electrically automated
 - Intermediate flange design, DN40-1200
 - Flange design, DN40-600
 - Casing materials: GG25, GGG40, steel, stainless steel
 - Disk materials: stainless steel, GGG40 with various coatings
 - Sealants: EPDM, NBR, FKM, PTFE, Silicone
 - Approval DVGW water + gas, DNV, Lloyd's Register

Beyond our standard delivery program, we will gladly develop, in close cooperation with your specialists, a tailor-made solution for your particular application.



Wir verfügen über langjährige Erfahrung in der effizienten Automatisierung von Schwenkarmaturen und bieten mit den pneumatischen Baureihen „actubar“ und „agturn“ sowie der elektrischen Baureihe „STV“ eine umfangreiche Auswahl an Schwenkantrieben.

We have many years of experience in the efficient automation of quarter-turn valves and offer an extensive selection of quarter-turn actuators with the pneumatic series „actubar“ and „agturn“, as well as the electric series „STV“.

► Pneumatische Antriebe „actubar“ und „agturn“:

- Insgesamt 35 fein abgestufte Antriebsgrößen mit Drehmomenten von 3 bis 13040 Nm
- Doppelt- und einfachwirkende Ausführung
- ATEX-konform, SIL 3-klassifiziert
- Gemäß Standards VDI/VDE 3845 und 3847, EN ISO 5211, NAMUR
- Temperaturbereich: -40 bis +160°C
- Diverse Beschichtungen für verschiedene Umgebungsbedingungen
- Direktaufbau von Zubehör über die patentierte „vacotrol“-Schnittstelle
- Edelstahl-Ausführung
- Hydraulische Dämpfung

► Pneumatic actuators „actubar“ and „agturn“:

- In total 35 finely graded actuator sizes with torque levels from 3 to 13040 Nm
- Double-acting and single-acting design
- ATEX compliant, SIL 3 classified
- In accordance with standards: VDI/VDE 3845 and 3847, EN ISO 5211, NAMUR
- Temperature range: -40 to +160°C
- Diverse coatings for varied environmental conditions
- Direct installation of the accessory using the patented „vacotrol“ interface
- Stainless steel design
- Hydraulic damping

► Elektrische Antriebe „STV“:

- 6 Antriebsserien mit Drehmomenten von 10 bis 15000 Nm
- 12 – 400 V
- Schutzarten bis IP 68
- Standardausstattung:
 - Endlagenrückmeldung
 - Handnotbetätigung
 - Drehmomentbegrenzung
 - Visuelle Stellungsanzeige
- Optional:
 - Positionsrückmeldung
 - Heizwiderstände
 - Positioner-Ausführung
 - FAILSAFE-Ausführung
 - ATEX-konforme Ausführung
 - CSA-konforme Ausführung

► Electrical actuators „STV“:

- 6 actuator series with torque levels from 10 to 15000 Nm
- 12 – 400 V
- Protection class up to IP 68
- Standard equipment:
 - Limit switch
 - Manual override
 - Torque limiter
 - Visual position indication
- Optional:
 - Position feedback
 - Heating resistors
 - Positioner design
 - FAILSAFE design
 - ATEX compliant design
 - CSA compliant design

Zubehör

Accessories



Die umfangreiche Palette an Zubehör zu unseren Antriebssystemen prägt die Reputation der bar GmbH als Innovationsführer und macht sie zu einem der führenden Anbieter in der Automatisierung von Armaturen. In Kombination mit unserem Armaturen- und Antriebs-Programm decken wir nahezu jede Kundenanforderung ab.

Wir bieten:

- ▶ Endschalterboxen für pneumatische Schwenkantriebe
 - Gehäusematerialien: Kunststoff, Aluminium, Edelstahl
 - Schwenkwinkelbereich: bis 180°
 - Temperaturbereich: -40° bis +70°C
 - Mikroschalter-, Näherungsschalter-Ausführungen
 - ATEX-konforme Ausführung
 - AS-Interface Ausführung
- ▶ Positioner für pneumatische Schwenkantriebe
 - Alle relevanten Signalein- und -ausgänge als Standard
 - Doppelt- und einfachwirkende Ausführung
 - Alle Sicherheitsfunktionen verfügbar (NC, NO, FS)
- ▶ 3-Positions-Regler für pneumatische Schwenkantriebe
 - Doppelt- und einfachwirkende Ausführung
 - Alle Sicherheitsfunktionen verfügbar (NC, NO, FS)
- ▶ Magnetventile
 - Gehäusematerialien: Aluminium, Edelstahl
 - Temperaturbereich: -40° bis +70°C
 - ATEX-konforme Ausführung
- ▶ Druckverstärker
- ▶ Handnotgetriebe
- ▶ Druckluftaufbereitung

The extensive range of accessories for our actuator systems shape the reputation of bar GmbH as a leader in innovation and make the company one of the leading suppliers in valve automation. In combination with our valve and actuator programs we can cover nearly any customer requirement.

We offer:

- ▶ Limit switch boxes for pneumatic actuators
 - Casing materials: plastic, aluminum, stainless steel
 - Pivot angle range: up to 180°
 - Temperature range: -40° to +70°C
 - Micro switch, proximity switch designs
 - ATEX compliant design
 - AS interface design
- ▶ Positioner for pneumatic actuators
 - All relevant signal inputs and outputs standard
 - Double and single-acting design
 - All safety functions available (NC, NO, FS)
- ▶ 3-position controller for pneumatic actuators
 - Double and single-acting design
 - All safety functions available (NC, NO, FS)
- ▶ Solenoid valves
 - Casing materials: aluminum, stainless steel
 - Temperature range: -40° to +70°C
 - ATEX compliant design
- ▶ Pressure booster
- ▶ Manual override
- ▶ Compressed air preparation

Chapter 2

Automatic valves

Automatic valves



The Valves product range comprises a complete portfolio of rotary valves for use in process control systems. We attach great importance to the application of highest quality materials, as well as the most modern production methods. In combination with our tried and tested operational processes, we ensure an excellent price/ performance ratio.

We offer:

- ▶ Manually-operated ball valves, pneumatically or electrically automated
 - Stainless steel, three-piece with internal threads or welding ends, DN15-100
 - Stainless steel, one-piece in a compact flange design, DN15-100
 - Stainless steel, two-piece with internal thread, PN100, DN15-50
 - Stainless steel, 3-way design with internal thread, DN15-50
 - Brass, 2-piece with internal thread, DN15-80
 - Brass, 3-way design with internal thread, DN15-50

- ▶ Butterfly valves, manually-operated pneumatically or electrically automated
 - Intermediate flange design, DN40-1200
 - Flange design, DN40-600
 - Casing materials: GG25, GGG40, steel, stainless steel
 - Disk materials: stainless steel, GGG40 with various coatings
 - Sealants: EPDM, NBR, FKM, PTFE, Silicone
 - Approval DVGW water + gas, DNV, Lloyd's Register

Beyond our standard delivery program, we will gladly develop, in close cooperation with your specialists, a tailor-made solution for your particular application.

2.1 Automatic valves

with pneumatic actuator type actubar®



Type PKI



Type PKN



Type PKO2



Type PKT



Type PKW



Type PMK2



Type PZDS

2/2-way automatic valve – type PKI

Product description



Automatic valve in stainless steel, 3-piece-design, with floating precision ball. The valve is pneumatically (double or single-acting) operated and is characterised by long service life and high operational safety.

Technical data 2/2-way ball-valve

Technical data	
Nominal size	DN15 – DN100
Connection	female thread Rp 1/2" - Rp 4" acc. to ISO 7-1 alternative: butt-weld ends acc. to EN 12627:1999
Mounting position	any orientation
Nominal pressure range	DN 15 – 50: PN 63 DN 65 – 100: PN 50
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball, stem: stainless steel AISI 316 (1.4401) seal: PTFE stem seal: DN 15 – DN 50 PTFE+ FKM, DN 65 – DN 80 PTFE
Flow medium	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (Standard) -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full bore
- maintenance-free
- optional extras with limit-switch-boxes and
- blowout-secure shaft
- application also in vacuum and high flow
- alternatively also with electric actuation, manual lever or gear-driven available

Special versions

On demand.

Pressure-temperature diagram

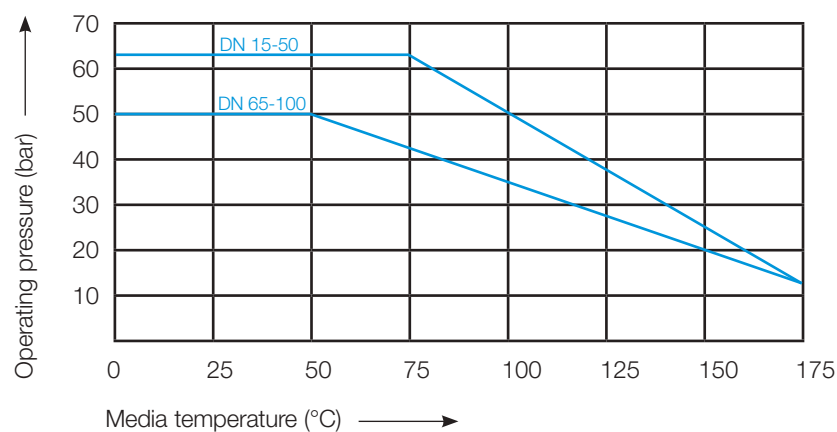


Table of dimensions

Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	SW	Weight (kg)
1/2"	15	001	80	70	120	22,5	G 1/8"	/	45	45	36	22	19	27	0,90
		002	136		134	27,5	G 1/8"	/	59	59					1,29
		004	144		158	24	G 1/8"	82	68	68					1,77
3/4"	20	002	136	77	127	27,5	G 1/8"	/	45	45	40	28	24	33,5	1,50
		004	144		165	24	G 1/8"	82	68	68					1,98
		006	159		181	32	G 1/8"	90	76	84					2,58
1/0"	25	002	136	92	154	27,5	G 1/8"	/	59	59	47	34	30	40	2,06
		004	144		178	24	G 1/8"	82	68	68					2,54
		006	159		194	32	G 1/8"	90	76	84					3,14
5/4"	32	004	144	105	186	24	G 1/8"	82	68	68	51	43	38	50	3,02
		006	159		202	32	G 1/8"	90	76	84					3,62
		008	173		226	31	G 1/8"	109	98	108					4,78
3/2"	40	006	159	120	214	32	G 1/8"	90	76	84	60	49	41,5	57	4,48
		008	173		238	31	G 1/8"	109	98	108					5,64
		011	215		238	31	G 1/8"	109	98	108					6,26
2/0"	50	018	213	140	262	35	G 1/4"	127	114	132	69	61	54	72	7,47
		006	159		233	32	G 1/8"	90	76	84					6,11
		008	173		247	31	G 1/8"	109	98	108					7,27
5/2"	65	011	215	185	247	31	G 1/8"	109	98	108	110	77	69	85	7,89
		018	213		271	35	G 1/4"	127	114	132					9,10
		018	213		332	35	G 1/4"	127	114	132					13,30
		037	266		361	40,5	G 1/4"	155	138	161					16,73

Table of dimensions (continuation)

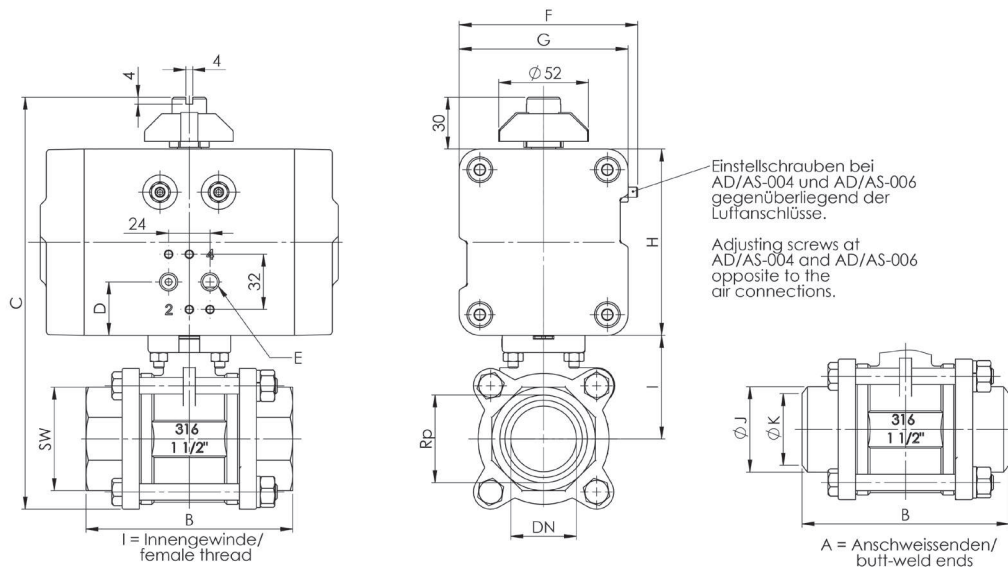
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	SW	Weight (kg)
3/0"	80	018	213	205	347	35	G 1/4"	127	114	132	118	90	84	100	17,10
		026	281		347	35	G 1/4"	127	114	132					18,57
		037	266	376	40,5	G 1/4"	155	138	161	20,53					
		050	347	376	40,5	G 1/4"	155	138	161	23,55					
		076	329	415	50	G 1/4"	195	176	200	28,20					
4/0"	100	026	281	240	390	35	G 1/4"	127	114	132	133	116	107	130	27,87
		037	266		419	40,5	G 1/4"	155	138	161					29,83
		050	347	419	40,5	G 1/4"	155	138	161	32,85					
		076	329	458	50	G 1/4"	195	176	200	37,50					

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AD-002	AD-001
3/4"	20	AD-002	AD-002
1/0"	25	AD-004	AD-002
5/4"	32	AD-004	AD-004
3/2"	40	AD-008	AD-006
2/0"	50	AD-008	AD-006
5/2"	65	AD-018	AD-018
3/0"	80	AD-026	AD-018
4/0"	100	AD-037	AD-026

AS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AS-004-08	AS-004-08
3/4"	20	AS-006-06	AS-004-10
1/0"	25	AS-008-06	AS-006-10
5/4"	32	AS-008-07	AS-006-12
3/2"	40	AS-018-06	AS-008-11
2/0"	50	AS-018-08	AS-011-12
3/2"	65	AS-037-07	AS-026-12
3/0"	80	AS-076-05	AS-037-10
4/0"	100	AS-076-07	AS-050-11

Dimensions



Ordering code

PKI-	1/0-	I-	025-	C-	AS 008-	07
	Connecting size in inch	Connection: I = female thread A = butt-weld ends	Nominal size	Spring effect: C = spring force closing A = spring force opening (details not applicable by double-acting version)	Actuator identification	Spring-code (details not applicable by double-acting version)

2/2-way automatic valve – type PKN

Product description



Automatic valve in stainless steel, with floating precision ball. The valve is pneumatically (double or single-acting) operated and is characterised by long service life and high operational safety.

Technical data 2/2-way ball valve

Technical data	
Nominal size	DN15 – DN50
Connection	female thread Rp 1/2" to Rp 2" acc. to ISO 7-1
Mounting position	any orientation
Nominal pressure	PN 100
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE+ FKM
Flow material	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full bore
- maintenance-free
- optional extras with limit-switch-boxes and
- application also in vacuum and high flow
- alternatively also with electric actuation, manual lever or gear-driven available

Special versions

On demand.

Pressure-temperature diagram

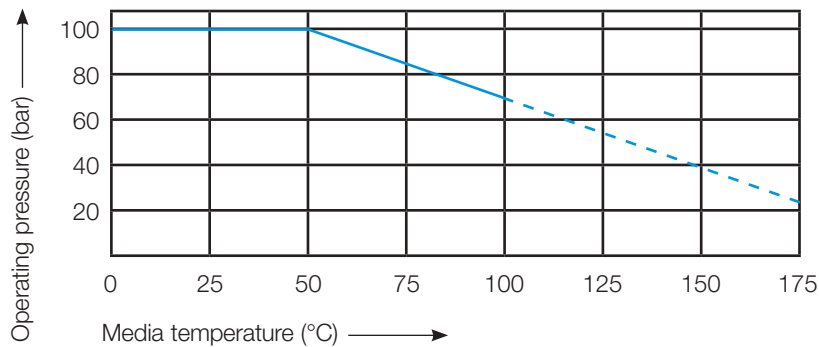


Table of dimensions

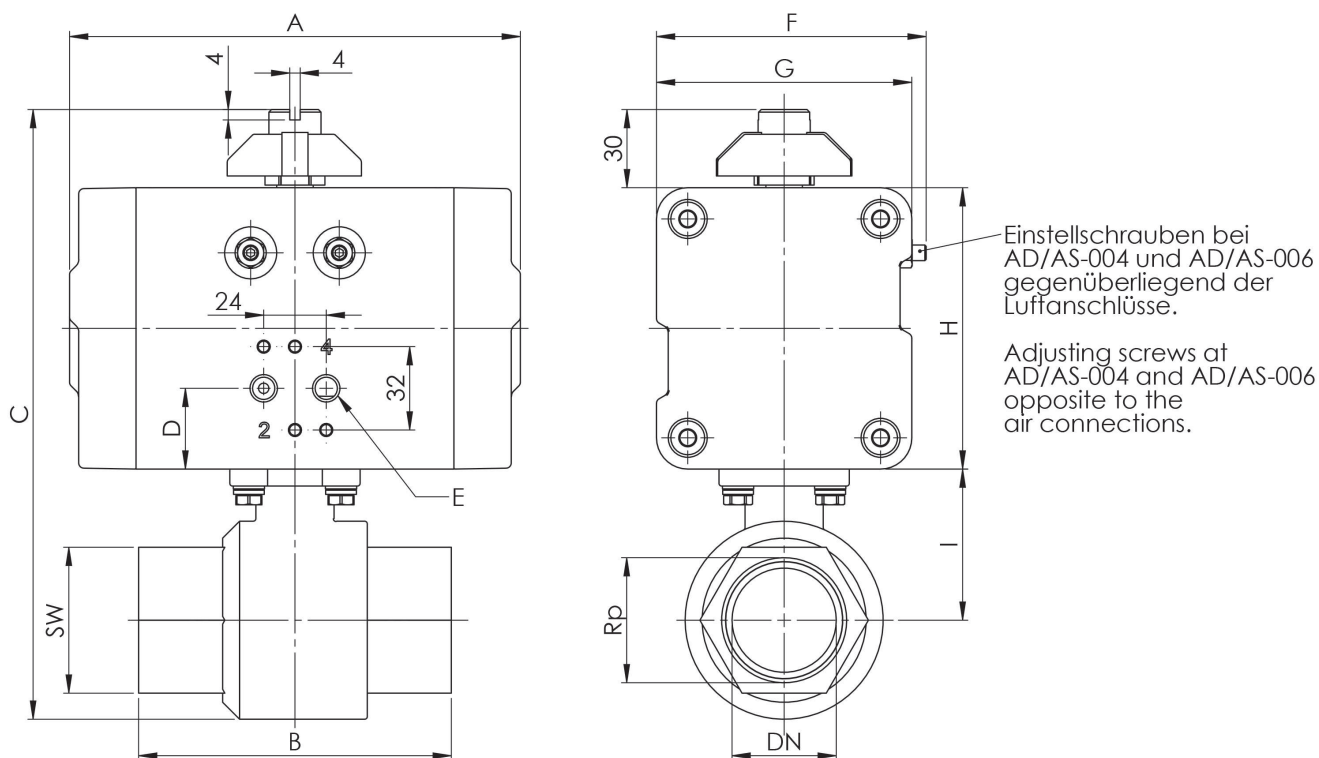
Rp	DN	Antrieb	A	B	C	D	E	F	G	H	I	SW	Gewicht (kg)
1/2"	15	001	80	60	113	22,5	G 1/8"	/	45	45	36	26	0,66
		002	136		127	27,5	G 1/8"	/	59	59			1,05
		004	144		151	24	G 1/8"	82	68	68			1,53
3/4"	20	002	136	70	135	27,5	G 1/8"	/	59	59	39,5	32	1,19
		004	144		159	24	G 1/8"	82	68	68			1,67
		006	159		175	32	G 1/8"	90	76	84			2,27
1/0"	25	004	144	90	168	24	G 1/8"	82	68	68	44	41	2,05
		006	159		184	32	G 1/8"	90	76	84			2,65
		008	173		208	31	G 1/8"	109	98	108			3,81
5/4"	32	004	144	110	181	24	G 1/8"	82	68	68	51	50	2,53
		006	159		197	32	G 1/8"	90	76	84			3,13
		008	173		221	31	G 1/8"	109	98	108			4,29
3/2"	40	011	215	120	221	31	G 1/8"	109	98	108	58	56	4,91
		006	159		210	32	G 1/8"	90	76	84			3,75
		008	173		234	31	G 1/8"	109	98	108			4,91
2/0"	50	011	215	140	234	31	G 1/8"	109	98	108	68	69	5,53
		018	213		258	35	G 1/4"	127	114	132			6,74
		006	159		230	32	G 1/8"	90	76	84			5,41
2/0"	50	008	173	140	254	31	G 1/8"	109	98	108	68	69	6,57
		011	215		254	31	G 1/8"	109	98	108			7,19
		018	213		278	35	G 1/4"	127	114	132			8,40

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AD-002	AD-001
3/4"	20	AD-002	AD-002
1/0"	25	AD-004	AD-004
5/4"	32	AD-006	AD-004
3/2"	40	AD-008	AD-006
2/0"	50	AD-011	AD-006

AS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AS-004-08	AS-004-08
3/4"	20	AS-006-06	AS-004-10
1/0"	25	AS-008-07	AS-006-10
5/4"	32	AS-011-08	AS-008-11
3/2"	40	AS-018-07	AS-011-10
2/0"	50	AS-018-08	AS-011-12

Dimensions



Ordering code

PKN-	1/0-	025-	C-	AS 008-	08
	Connecting size in inch	Nominal size	Spring effect: C = spring force closing A = spring force opening (details not applicable by double-acting version)	Actuator identification	Spring-code (details not applicable by double-acting version)

2/2-way automatic valve – type PKO2

Product description



Automatic valve in brass with floating precision ball. The valve is pneumatically (double or singleacting) operated and is characterised by long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN12 – DN80
Connection type	inside thread G 1/2" to G 3" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 12 – 25: PN 40 DN 32: PN 32 DN 40 – 65: PN 30 DN 80: PN 25
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full bore
- maintenance-free
- optional extras with limit-switch-boxes and solenoid valves, positioners
- blow-out secure shaft
- application also in vacuum and high flow speeds
- alternatively also with electric actuation, manual lever or gear-driven available

Special versions

On demand.

Pressure-temperature diagram

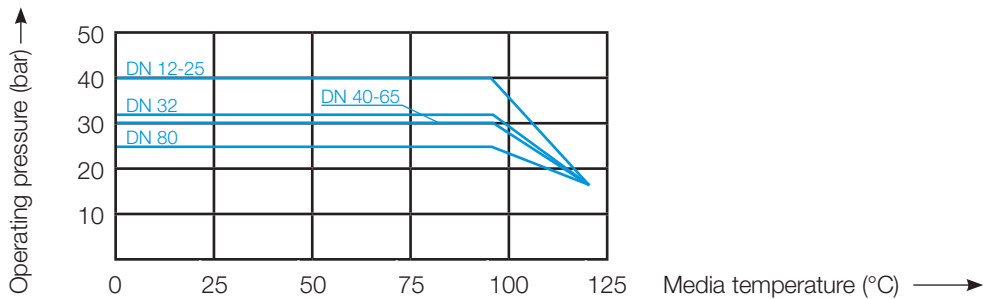


Table of dimensions

Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	SW	Weight (kg)
1/4"	12	001	80	64	104,5	22,5	G 1/8"	/	45	45	29	26	0,68
		002	136		118,5	27,5	G 1/8"	/	59	59			1,07
		004	144		142,5	24	G 1/8"	82	68	68			1,55
3/8"	15	001	80	64	104,5	22,5	G 1/8"	/	45	68	29	26	0,66
		002	136		118,5	27,5	G 1/8"	/	59	59			1,05
		004	144		142,5	24	G 1/8"	82	68	68			1,53
1/2"	15	001	80	64	104,5	22,5	G 1/8"	/	45	45	29	26	0,62
		002	136		118,5	27,5	G 1/8"	/	59	59			1,01
		004	144		142,5	24	G 1/8"	82	68	68			1,49
3/4"	20	001	80	76	112,0	22,5	G 1/8"	/	45	45	32,5	32	0,75
		002	136		126,0	27,5	G 1/8"	/	59	59			1,14
		004	144		150,0	24	G 1/8"	82	68	68			1,62
		006	159		166,0	32	G 1/8"	90	76	84			2,22
1/0"	25	002	136	88	134,0	27,5	G 1/8"	/	59	59	37	40	1,44
		004	144		158,0	24	G 1/8"	82	68	68			1,92
		006	159		174,0	32	G 1/8"	90	76	84			2,52
5/4"	32	002	136	96	144,5	27,5	G 1/8"	/	59	59	42	50	1,68
		004	144		168,5	24	G 1/8"	82	68	68			2,16
		006	159		184,5	32	G 1/8"	90	76	84			2,76
		008	173		208,5	31	G 1/8"	109	98	108			3,92
3/2"	40	004	144	103	190,0	24	G 1/8"	82	68	68	58	54	2,37
		006	159		206,0	32	G 1/8"	90	76	84			2,97
		011	215		230,0	31	G 1/8"	109	98	108			4,13
		018	213		254,0	35	G 1/4"	127	114	132			4,75
2/0"	50	004	144	121	203,0	24	G 1/8"	82	68	68	64	70	3,27
		006	159		219,0	32	G 1/8"	90	76	84			3,87
		011	215		243,0	31	G 1/8"	109	98	108			5,03
		018	213		267,0	35	G 1/4"	127	114	132			5,65

Table of dimensions (continuation)

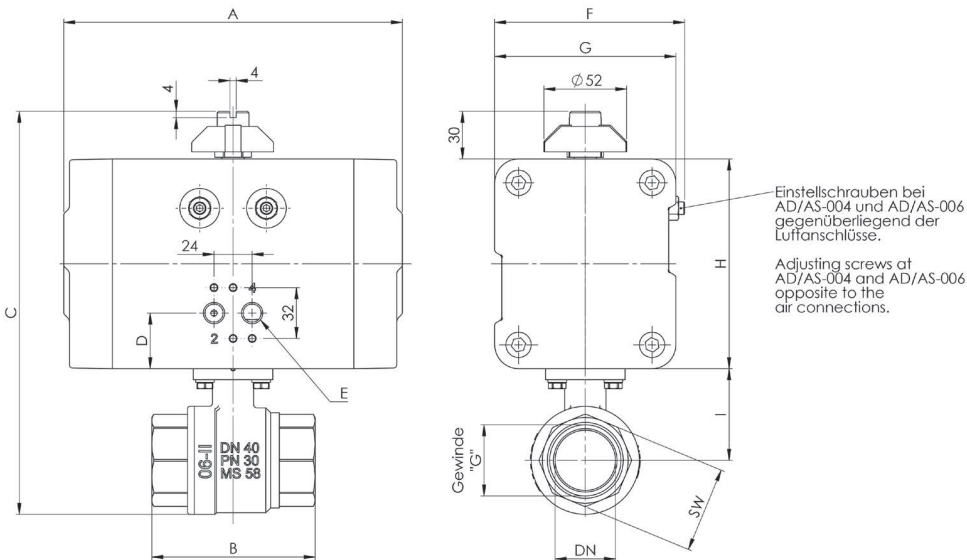
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	SW	Weight (kg)
5/2"	65	006	159	165	259,0	32	G 1/8"	90	76	84	90	85	5,66
		008	173		283,0	31	G 1/8"	109	98	108			6,82
		018	213		307,0	35	G 1/4"	127	114	132			7,44
		026	281		307,0	35	G 1/4"	127	114	132			8,65
3/0"	80	008	173	188	303,0	31	G 1/8"	109	98	108	100	100	8,49
		011	215		303,0	31	G 1/8"	109	98	108			9,11
		018	213		327,0	35	G 1/4"	127	114	132			10,32
		026	281		327,0	35	G 1/4"	127	114	132			11,79

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar actuators	6 bar actuators
1/4"	12	AD-001	AD-001
3/8"	15	AD-001	AD-001
1/2"	15	AD-001	AD-001
3/4"	20	AD-002	AD-001
1/0"	25	AD-002	AD-002
5/4"	32	AD-004	AD-002
3/2"	40	AD-006	AD-004
2/0"	50	AD-006	AD-004
5/2"	65	AD-008	AD-006
3/0"	80	AD-008	AD-006

AS			
Rp	DN	4 bar actuators	6 bar actuators
1/4"	12	AS-004-06	AS-002-08
3/8"	15	AS-004-06	AS-002-08
1/2"	15	AS-004-06	AS-002-08
3/4"	20	AS-006-06	AS-004-10
1/0"	25	AS-006-08	AS-004-10
5/4"	32	AS-008-07	AS-006-12
3/2"	40	AS-018-07	AS-011-10
2/0"	50	AS-018-07	AS-011-10
5/2"	65	AS-026-06	AS-018-09
3/0"	80	AS-026-06	AS-018-09

Dimensions



Ordering code

PKO-	1/0-	025-	C-	AS 006-	08
	Connecting size in inch	Nominal size	Spring effect: C = spring force closing A = spring force opening (details not applicable by double-acting version)	Actuator identification	Spring-code (details not applicable by double-acting version)

3/2-way automatic valve – type PKT

Product description



Automatic 3-way valve in stainless steel, with floating precision ball. The valve is pneumatically (double or single-acting) operated and is characterised by long service life and high operational safety.

Technical data 3/2-way ball valve

Technical data	
Nominal size	DN12 – DN38
Connection	female thread Rp 1/2" to Rp 2" acc. to ISO 7-1
Mounting position	any orientation
Nominal pressure range	DN 12 – 20: PN 63 DN 25 – 38: PN 50
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE+ FKM
Flow material	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- reduced bore
- 4-fold support of the ball
- maintenance-free
- optionally extras with limit-switch-boxes and solenoid valves, positioners
- blow-out secure shaft
- application also in vacuum and high flow speeds
- alternatively also with electric actuation, manual lever or gear-driven available

Special versions

On demand.

Pressure-temperature diagram

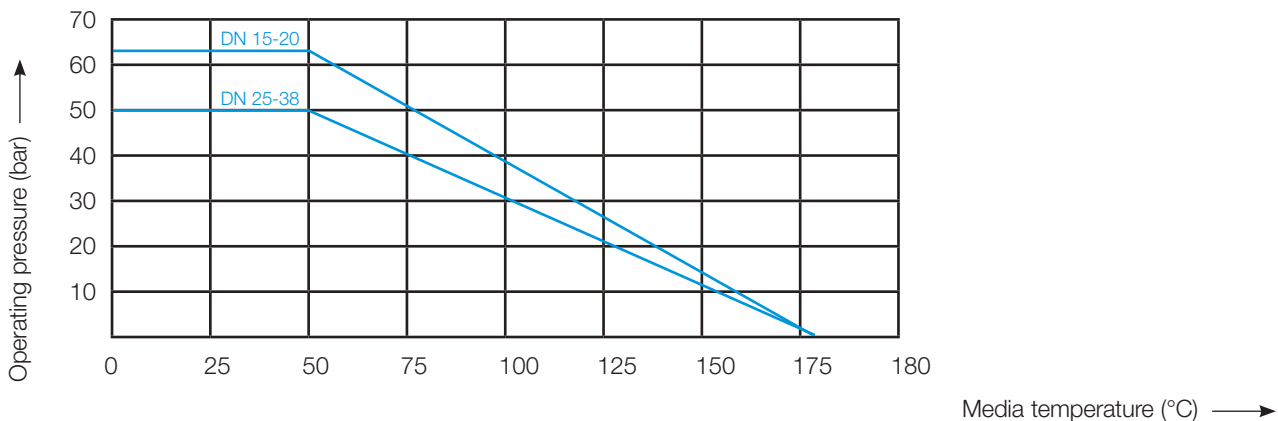


Table of dimensions

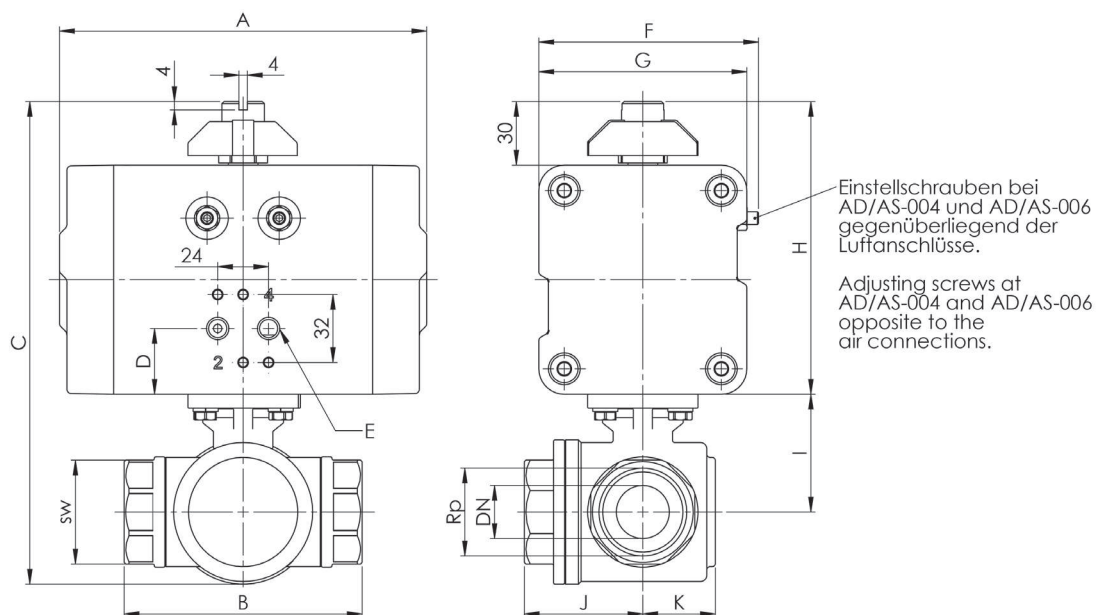
Rp	DN	Antrieb	A	B	C	D	E	F	G	H	I	J	K	SW	Gewicht (kg)
1/2"	12	002	136	72	133	27,5	G 1/8"	/	59	59	38,5	36	20	28	1,37
		004	144		157	24	G 1/8"	82	68	68					1,85
		006	159		173	32	G 1/8"	90	76	84					2,45
3/4"	15	002	136	83	138	28	G 1/8"	/	59	59	41	41,5	23	32,5	1,58
		004	144		162	24	G 1/8"	82	68	68					2,06
		006	159		178	32	G 1/8"	90	76	84					2,66
		008	173		202	31	G 1/8"	109	98	108					3,82
1"	20	004	144	99	175	24	G 1/8"	82	68	68	49	49,5	28	41	2,67
		006	159		191	32	G 1/8"	90	76	84					3,27
		008	173		215	31	G 1/8"	109	98	108					4,43
5/4"	25	006	159	112	203	32	G 1/8"	90	76	84	55	56	34,5	49,5	3,99
		008	173		227	31	G 1/8"	109	98	108					5,15
		011	215		227	31	G 1/8"	109	98	108					5,77
		018	213		251	35	G 1/4"	127	114	132					6,98
3/2"	32	011	215	125	240	31	G 1/8"	109	98	108	63	62,5	37,5	56,5	6,87
		018	213		264	35	G 1/4"	127	114	132					8,08
		026	281		264	35	G 1/4"	127	114	132					9,55
		037	266		293	40,5	G 1/4"	155	138	161					11,51
		011	215		260	31	G 1/8"	109	98	108					8,83
2/0"	38	018	213	149	284	35	G 1/4"	127	114	132	74	74,5	48	69,5	10,04
		026	281		284	35	G 1/4"	127	114	132					11,51
		037	266		313	40,5	G 1/4"	155	138	161					13,47

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	12	AD-004	AD-002
3/4"	15	AD-004	AD-002
1/0"	20	AD-004	AD-004
5/4"	25	AD-008	AD-006
3/2"	32	AD-018	AD-011
2/0"	38	AD-018	AD-011

AS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	12	AS-006-08	AS-004-10
3/4"	15	AS-008-06	AS-006-10
1/0"	20	AS-008-07	AS-006-12
5/4"	25	AS-018-07	AS-011-11
3/2"	32	AS-037-06	AS-026-10
2/0"	38	AS-037-07	AS-026-11

Dimensions



Ordering code

PKT-	1/0-	T2-	020-	AS 008-	07
	Connecting size in inch	Switch position (see diagram right)	Nominal size	Actuator identification	Spring-code (details not applicable by double-acting version)

Switching positions

ball bore		T				L
Position	0°					
	90°					
Switching positions		T1	T2	T3	T4	L4

2/2-way automatic valve – type PKW

Product description



Automatic valve in stainless steel, with floating precision ball. The valve is pneumatically (double or single-acting) operated and is characterised by long service life and high operational safety.

Technical data 2/2-way ball valve

Technical data	
Nominal size	DN15 – DN100
Connection	between flanges acc. to DIN EN 1092
Mounting position	any orientation
Nominal pressure	DN 15 – 50, DN 80: PN 40 DN 65, DN 100: PN 16
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE
Flow medium	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (Standard) -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° bis -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full bore
- maintenance-free
- optional extras with limit-switch-boxes and solenoid valves, positioners
- blow-out secure shaft
- application also in vacuum and high flow speeds
- alternatively also with electric actuation, manual lever or gear-driven available

Special versions

On demand.

Pressure-temperature diagram

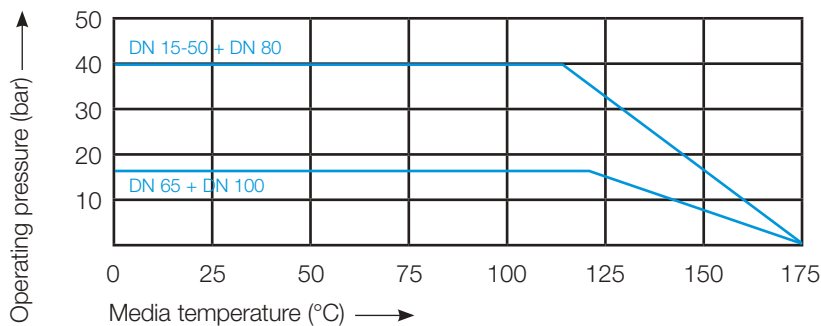


Table of dimensions

Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	M/M1	Weight (kg)
1/2"	15	002	136	41	123	27,5	G 1/8"	/	59	59	49	81	65	4 x M12	16/2	1,96
		004	144		147	24	G 1/8"	82	68	68						2,44
		006	159		163	32	G 1/8"	90	76	84						3,04
3/4"	20	002	136	44	128	27,5	G 1/8"	/	59	59	54	99	75	4 x M12	18/2	2,66
		004	144		152	24	G 1/8"	82	68	68						3,14
		006	159		168	32	G 1/8"	90	76	84						3,74
		008	173		192	31	G 1/8"	109	98	108						4,90
1/0"	25	004	144	50	163	24	G 1/8"	82	68	68	65	115	85	4 x M12	18/2	3,85
		006	159		179	32	G 1/8"	90	76	84						4,45
		011	215		203	31	G 1/8"	109	98	108						6,23
		018	213		227	35	G 1/4"	127	114	132						7,44
5/4"	32	004	144	60	175	24	G 1/8"	82	68	68	77	140	100	4 x M16	18/2	5,33
		006	159		191	32	G 1/8"	90	76	84						5,93
		011	215		215	31	G 1/8"	109	98	108						7,71
		018	213		239	35	G 1/4"	127	114	132						8,92
3/2"	40	006	159	65	224	31	G 1/8"	109	98	108	86	150	110	4 x M16	18/3	7,21
		008	173		224	31	G 1/8"	109	98	108						8,37
		011	215		224	31	G 1/8"	109	98	108						8,99
		026	281		248	35	G 1/4"	127	114	132						11,67
		037	266		277	40,5	G 1/4"	150	138	161						13,63
2/0"	50	011	213	80	231	31	G 1/8"	109	98	108	93	165	125	4 x M16	20/3	10,12
		018	281		255	35	G 1/4"	127	114	132						11,33
		026	347		255	35	G 1/4"	150	114	132						12,80
		037	329		284	40,5	G 1/4"	190	138	161						14,76
		018	281		272	35	G 1/4"	127	114	132						16,33
5/2"	65	026	266	110	272	35	G 1/4"	127	114	132	110	185	145	4 x M16	22/3	17,80
		050	329		301	40,5	G 1/4"	150	138	161						22,78
		076	475		340	50	G 1/4"	190	176	200						27,43

Table of dimensions (continuation)

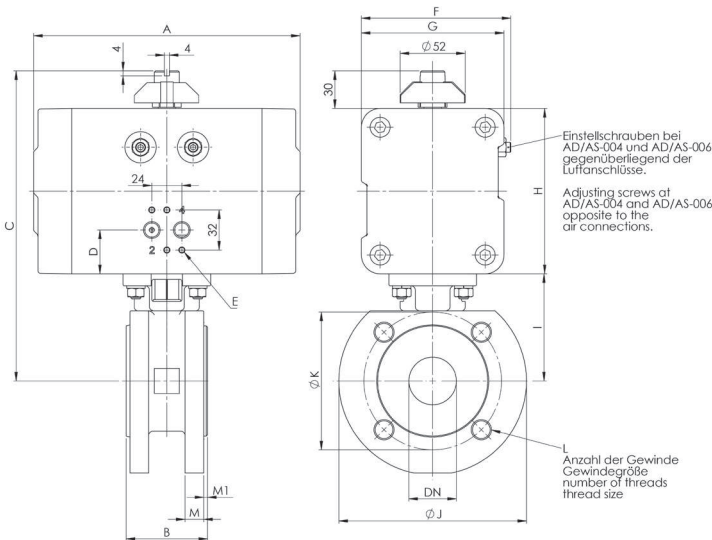
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	M/M1	Weight (kg)
3/0"	80	018	213	120	282	35	G 1/4"	127	114	132	120	200	160	8 x M16	24/3	19,19
		026	281		282	35	G 1/4"	127	114	132						20,66
		050	347		311	41	G 1/4"	150	138	161						25,64
		076	329		350	50	G 1/4"	150	176	200						30,29
4/0"	100	026	281	150	294	35	G 1/4"	127	114	132	132	220	180	8 x M16	20/3	26,17
		037	266		323	40,5	G 1/4"	150	138	161						28,13
		076	329		362	50	G 1/4"	190	176	200						35,80
		110	475		362	50	G 1/4"	190	176	200						42,84

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AD-002	AD-002
3/4"	20	AD-004	AD-002
1/0"	25	AD-006	AD-004
5/4"	32	AD-006	AD-004
3/2"	40	AD-011	AD-006
2/0"	50	AD-018	AD-011
5/2"	65	AD-026	AD-018
3/0"	80	AD-026	AD-018
4/0"	100	AD-037	AD-026

AS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	AS-006-08	AS-004-12
3/4"	20	AS-008-06	AS-006-10
1/0"	25	AS-018-07	AS-011-10
5/4"	32	AS-018-08	AS-011-12
3/2"	40	AS-037-06	AS-026-09
2/0"	50	AS-037-07	AS-026-12
5/2"	65	AS-076-06	AS-050-09
3/0"	80	AS-076-07	AS-050-11
4/0"	100	AS-110-06	AS-076-10

Dimensions



Ordering code

PKW-	1/0-	025-	C-	AS 008-	07
	Connecting size in inch	Nominal size	Spring effect: C = spring force closing A = spring force opening (details not applicable by double-acting version)	Actuator identification	Spring-code (details not applicable by double-acting version)

3/2-way automatic valve – type PMK2

Product description



Automatic 3-way valve in brass, with floating precision ball. The valve is pneumatically (double or single-acting) operated and is characterised by long service life and high operational safety.

Technical data 3/2-way ball valve

Technical data	
Nominal size	DN10 – DN50
Connection type	inside thread G 3/8" to G 2" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 10 – 20: PN 30, DN 25 – 32: PN 20, DN 40 – 50: PN 16
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, hard chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (further mediums upon request) acc. to DIN ISO 8573-1 Class 4 (min. requirement)
Ambient temperature	-20 °C to +80 °C (standard), -20 °C to +160 °C
Actuation	pneumatic double or single-acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Special versions

On demand.

Product features

- full bore
- 4-fold support of the ball
- maintenance-free
- optionally equipped with limit switch boxes, positioners and solenoid valves
- blow-out secure shaft
- application also in vacuum and high flow speeds
- alternatively also with electric actuation, manual lever or gear-driven available

Pressure-temperature diagram

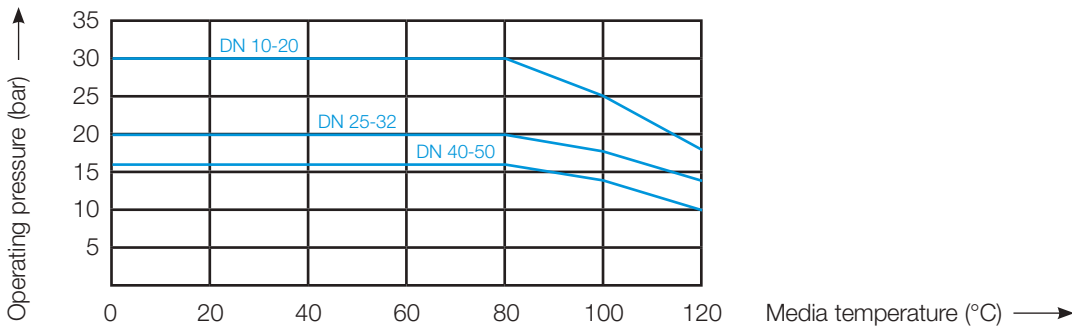


Table of dimensions

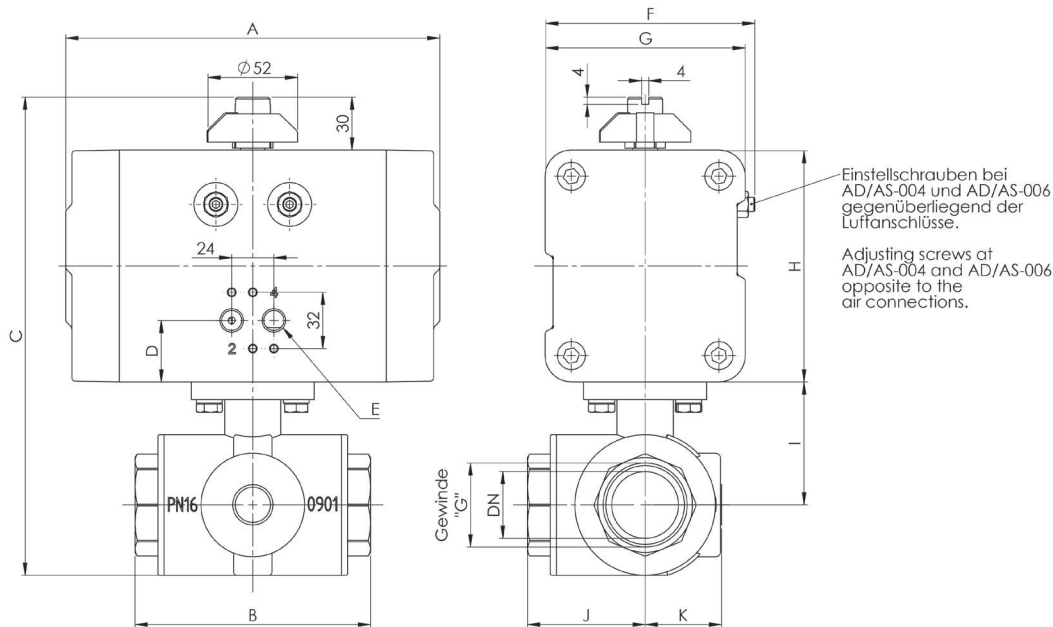
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	J	K	SW	Weight (kg)
1/4"	10	001	80	65	105,5	22,5	G 1/8"	/	45	45	30	32,5	18,5	22	0,76
		002	136		119,5	27,5	G 1/8"	/	59	59					1,15
		004	144		143,5	24	G 1/8"	82	68	68					1,63
3/8"	10	001	80	65	105,5	22,5	G 1/8"	/	45	45	30	32,5	18,5	22	0,73
		002	136		119,5	27,5	G 1/8"	/	59	59					1,12
		004	144		143,5	24	G 1/8"	82	68	68					1,60
1/2"	15	001	80	78	111,5	22,5	G 1/8"	/	45	45	33	39	22,5	27	0,91
		002	136		125,5	27,5	G 1/8"	/	59	59					1,30
		004	144		149,5	24	G 1/8"	82	68	68					1,78
		006	159		165,5	32	G 1/8"	90	76	84					2,38
3/4"	20	002	136	87	138,5	27,5	G 1/8"	/	59	59	42	43,5	26,5	32	1,61
		004	144		162,5	24	G 1/8"	82	68	68					2,09
		006	159		178,5	32	G 1/8"	90	76	84					2,69
		008	173		202,5	31	G 1/8"	109	98	108					3,85
		011	215		202,5	31	G 1/8"	109	98	108					4,47
1/0"	25	004	144	105	173,0	24	G 1/8"	82	68	68	47	52,5	32,5	40	2,68
		006	159		189,0	32	G 1/8"	90	76	84					3,28
		008	173		213,0	31	G 1/8"	109	98	108					4,44
		011	215		213,0	31	G 1/8"	109	98	108					5,06
		018	213		237,0	35	G 1/4"	127	114	132					6,27
5/4"	32	004	144	118	182,0	24	G 1/8"	82	68	68	52	59	36,5	49	3,20
		006	159		198,0	32	G 1/8"	90	76	84					3,80
		008	173		222,0	31	G 1/8"	109	98	108					4,96
		011	215		222,0	31	G 1/8"	109	98	108					5,58
		018	213		246,0	35	G 1/4"	127	114	132					6,79
3/2"	40	006	159	134	224,0	32	G 1/8"	90	76	84	70	67	43,5	54	5,45
		008	173		248,0	31	G 1/8"	109	98	108					6,61
		018	213		272,0	35	G 1/4"	127	114	132					8,44
		026	281		272,0	35	G 1/4"	127	114	132					9,91
		006	159		243,0	32	G 1/8"	90	76	84					7,96
2/0"	50	008	173	161	267,0	31	G 1/8"	109	98	108	79,5	80,5	54,5	67	9,12
		018	213		391,0	35	G 1/4"	127	114	132					10,95
		006	159		243,0	32	G 1/8"	90	76	84					7,96
		026	281		391,0	35	G 1/4"	127	114	132					12,42

Actuator classification (for max. diff. press. of 10 bar)

AD			
Rp	DN	4 bar Antriebe	6 bar Antriebe
„G“	10	AD-001	AD-001
3/8“	10	AD-001	AD-001
1/2“	15	AD-002	AD-001
3/4“	20	AD-004	AD-002
1/0“	25	AD-006	AD-004
5/4“	32	AD-006	AD-004
3/2“	40	AD-008	AD-006
2/0“	50	AD-008	AD-006

AS			
Rp	DN	4 bar Antriebe	6 bar Antriebe
1/4“	10	AS-004-06	AS-002-08
3/8“	10	AS-004-06	AS-002-08
1/2“	15	AS-006-06	AS-004-10
3/4“	20	AS-011-07	AS-006-12
1“	25	AS-018-06	AS-008-11
1 1/4“	32	AS-018-06	AS-008-11
1 1/2“	40	AS-026-06	AS-018-09
2“	50	AS-026-08	AS-018-11

Dimensions



Ordering code

PMK-	1/0-	T2-	025-	AS 008-	07
	Connecting size in inch	Switch position (see diagram right)	Nominal size	Actuator identification	Spring-code (details not applicable by double-acting version)

Switching positions

ball bore		T				L
Position	0°					
	90°					
clockwise						
Switching positions		T1	T2	T3	T4	L4

Automatic butterfly valve – type PZDS

Product description



One-piece, blow-out safe, flow-fitting form, sealed-off and centric embedded butterfly-valve. The automated butterfly-valve is pneumatically operated (double- or single-acting).

Technical data butterfly-valve

Technical data	
Nominal size	DN 25 to DN 600
Connection	flange connection as per EN 1092-1 and EN 1092-2 PN6/10/16/25/40, ASME/ANSI 125/150, BS10-and BS10-e, JIS B2238 and JIS B2239 (more details on request)
Mounting position	any orientation
Nominal pressure	DN 25: max. 10 bar DN 32 – 350: max. 20 bar DN 400 – 600: max. 10 bar
Installation length	acc. to EN 558-1, row 20 ISO 5752, row 20 API 609 diagram 2 (except DN 400 - 600)
Temperature range	seat EPDM -15°C to +120°C
Material of butterfly valve parts	casing: DN 25 – cast iron GG25 casing: DN 32 – 600 – ductile cast GGG40 disk: stainless steel 1.4408 shaft: stainless steel 1.4028 seat: EPDM
Flow media	compare to the list of material resistance
Flow direction	any direction

Technical data actuator AD/AS

Technical data	
Control pressure	2 – 8 bar
Control medium / quality	air or neutral gases, (further media upon request), acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	from -20°C to +80°C (standard), from -20°C to +160°C (high temperature version)
Actuation	pneumatic double or single acting
End position setting	+5° to -10° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product Features

- conformity Directive 2014/68/EU (PED)
- ATEX Directive 2014/34/EU (ATEX)
- testing for tightness EN12266-1
- testing for a nti-static EN12266-2
- very good power transmission through robust multi-toothing between shaft and valve-disc.
- easy maintenance and blowout-safe shaft by a circlip.
- changeable disc and seat.
- shaft and casing without contact to the media inside.
- self-lubricating bearing bush
- casing 80µm epoxy-coated
- casing colour RAL 5017, blue
- seat NBR, FKM, silicone, EPDM -white on request.
- optionally equipped with limit stop indication, solenoid valves and positioner
- on request application at vacuum.
- alternatively deliverable with detent lever, gear or electric actuator.

Table of dimensions

Nominal width	Actuator	A	B	C	D	E	F	G	H	I	J	Weight (kg)
40	004	144	32	285	24	G 1/8"	82	68	68	130	/	2,91
	006	159		301	32	G 1/8"	90	76	84		/	3,51
	008	173		325	31	G 1/8"	109	98	108		/	4,67
	011	215		325	31	G 1/8"	109	98	108		/	5,29
50	004	144	32	296	24	G 1/8"	82	68	68	136	/	3,81
	006	159		312	32	G 1/8"	90	76	84		/	4,41
	008	173		336	31	G 1/8"	109	98	108		/	5,57
	011	215		336	31	G 1/8"	109	98	108		/	6,19
	018	213		360	36,5	G 1/4"	122	114	132		/	7,40
65	006	159	46	343	32	G 1/8"	90	76	84	145	/	4,71
	008	173		367	31	G 1/8"	109	98	108		/	5,87
	011	215		367	31	G 1/8"	109	98	108		/	6,49
	018	213		391	36,5	G 1/4"	127	114	132		/	7,70
	026	281		451	36,5	G 1/4"	127	114	132		60	10,05
80	006	159	46	354	32	G 1/8"	90	76	84	151	/	5,41
	008	173		378	31	G 1/8"	109	98	108		/	6,57
	011	215		378	31	G 1/8"	109	98	108		/	7,19
	018	213		402	36,5	G 1/4"	127	114	132		/	8,40
	026	281		462	36,5	G 1/4"	127	114	132		60	10,75
100	011	215	52	419	31	G 1/8"	109	98	84	175	/	7,99
	018	213		443	36,5	G 1/4"	127	114	132		/	9,20
	026	281		443	36,5	G 1/4"	127	114	132		60	11,55
	037	266		472	40,5	G 1/4"	155	138	161		60	13,51

Table of dimensions (continuation)

Nominal width	Actuator	A	B	C	D	E	F	G	H	I	J	Weight (kg)
125	018	213	56	472	36,5	G 1/4"	127	114	132	190	/	11,10
	026	281		472	36,5	G 1/4"	127	114	132		/	12,57
	037	266		501	40,5	G 1/4"	155	138	161		/	14,53
	050	347		501	40,5	G 1/4"	155	138	161		/	17,55
	076	329		620	50	G 1/4"	196	176	200		80	23,83
150	026	281	56	496	36,5	G 1/4"	127	114	132	203	/	13,57
	037	266		525	40,5	G 1/4"	155	138	161		/	15,53
	050	347		525	40,5	G 1/4"	155	138	161		/	18,55
	076	329		644	50	G 1/4"	196	176	200		80	24,83
200	037	266	60	581	40,5	G 1/4"	155	138	161	225	/	21,93
	050	347		581	40,5	G 1/4"	155	138	161		/	24,95
	076	329		620	50	G 1/4"	196	176	200		80	31,23
	110	475		620	50	G 1/4"	196	176	200		80	38,27
250	050	347	68	653	40,5	G 1/4"	155	138	161	266	/	31,35
	076	329		692	50	G 1/4"	196	176	200		/	36,00
	110	475		692	50	G 1/4"	196	176	200		/	43,04
	160	516		712	60	G 1/4"	225	199	220		/	47,56
	230	560		816	72	G 1/4"	249	223	244		80	61,44
300	076	329	77	758	50	G 1/4"	196	176	200	290	/	45,10
	110	475		758	50	G 1/4"	196	176	200		/	52,14
	160	516		778	60	G 1/4"	225	199	220		/	56,66
	230	560		882	72	G 1/4"	249	223	244		80	70,54
	360	696		978	50	G 1/2"	/	278	320		100	90,00
350	110	475	77	805	50	G 1/4"	196	176	200	305	/	59,14
	160	516		825	60	G 1/4"	225	199	220		/	63,66
	230	560		929	72	G 1/4"	249	223	244		80	77,75
	360	696		1025	50	G 1/2"	/	278	320		100	97,10
400	110	475	102	894	50	G 1/4"	196	176	200	378	/	79,94
	160	516		914	60	G 1/4"	225	199	220		/	84,46
	230	560		1018	72	G 1/4"	249	223	244		80	98,55
	360	696		1114	50	G 1/2"	/	278	320		100	117,90
	520	716		1162	50	G 1/2"	/	323	368		100	133,90
450	160	516	114	1062	60	G 1/4"	225	199	220	417	80	117,24
	230	560		1006	72	G 1/4"	249	223	244		/	125,10
	360	696		1182	50	G 1/4"	/	278	320		100	148,20
	520	716		1230	50	G 1/4"	/	323	368		100	164,20
	800	725		1286	50	G 1/2"	/	371	424		100	195,80
500	230	560	127	1069	72	G 1/4"	249	223	244	440	/	115,10
	360	696		1245	50	G 1/4"	/	278	320		100	138,20
	520	716		1293	50	G 1/4"	/	323	368		100	154,20
	800	725		1349	50	G 1/2"	/	371	424		100	185,80
600	520	716	154	1408	50	G 1/4"	/	323	368	495	100	218,20
	800	725		1464	50	G 1/2"	/	371	424		100	249,80

Actuator classification

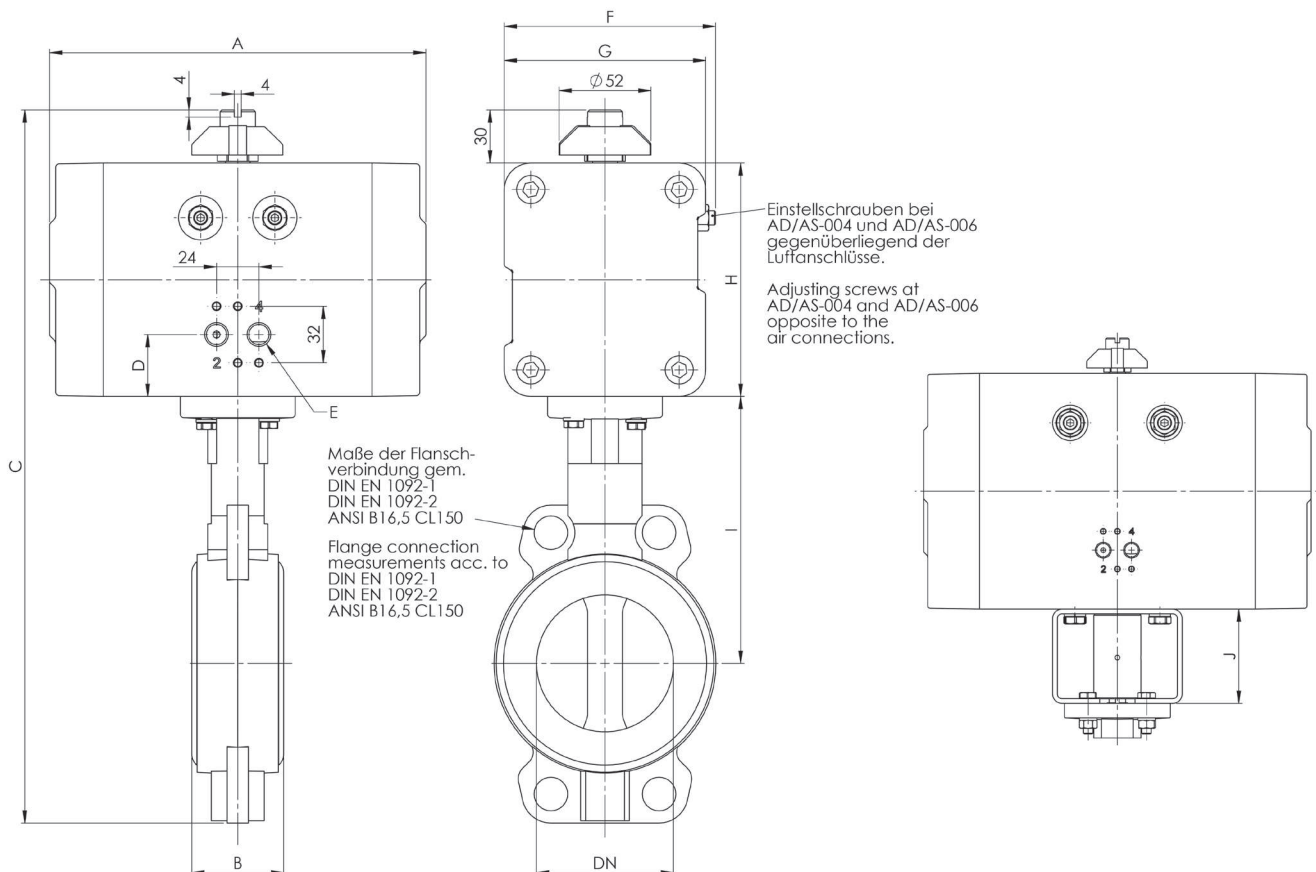
AD/AS at minimum control pressure of 4 bar			
DN	AD Pst = 4 bar	AS, spring closed, Pst = 4 bar	AS, spring open, Pst = 4 bar
40	AD-004	AS-011-09	AS-008-06
50	AD-006	AS-018-08	AS-011-06
65	AD-008	AS-026-08	AS-018-06
80	AD-008	AS-026-08	AS-018-06
100	AD-018	AS-037-08	AS-026-06
125	AD-026	AS-076-07	AS-050-06
150	AD-037	AS-076-09	AS-076-06
200	AD-050	AS-110-09	AS-110-06
250	AD-076	AS-230-08	AS-160-05
300	AD-110	AS-360-07	AS-230-06
350	AD-160	AS-360-07	AS-360-05
400	AD-160	AS-520-09	AS-360-05
450	AD-230	AS-800-07	AS-520-07
500	AD-360	AS-800-08	AS-800-05
600	AD-800		

AD/AS at minimum control pressure of 6 bar			
DN	AD Pst = 6 bar	AS, spring closed, Pst = 6 bar	AS, spring open, Pst = 6 bar
40	AD-004	AS-008-11	AS-006-10
50	AD-004	AS-008-13	AS-008-06
65	AD-006	AS-018-11	AS-011-09
80	AD-006	AS-018-12	AS-011-09
100	AD-011	AS-026-13	AS-018-09
125	AD-018	AS-037-13	AS-026-09
150	AD-026	AS-050-13	AS-050-08
200	AD-037	AS-076-13	AS-076-08
250	AD-050	AS-110-13	AS-110-08
300	AD-076	AS-230-12	AS-160-09
350	AD-110	AS-230-14	AS-230-09
400	AD-110	AS-360-09	AS-230-09
450	AD-160	AS-520-12	AS-360-10
500	AD-230	AS-800-09	AS-520-09
600	AD-520		

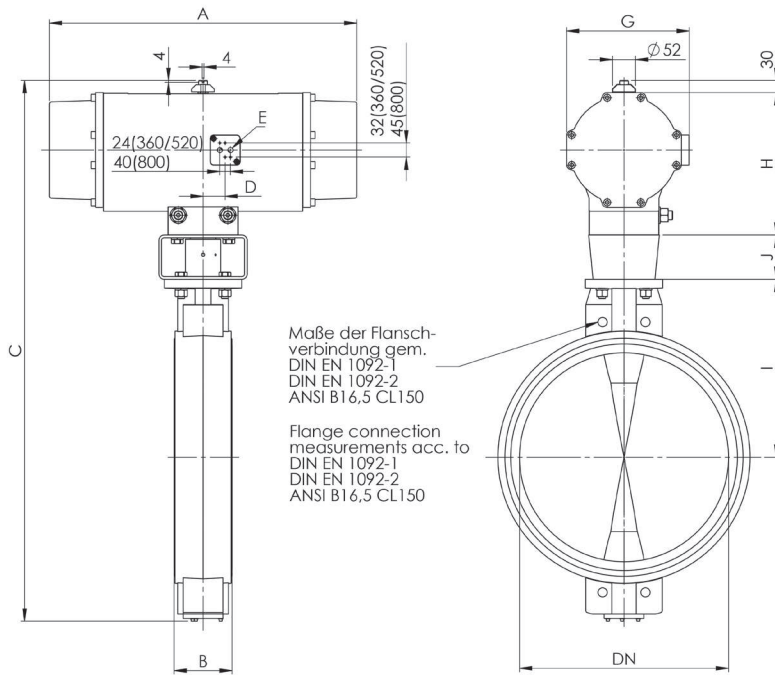
Actuator sizing for liquid media,
control pressure PN10/16

Actuator sizing for liquid media,
control pressure PN10/16

Dimensioned drawings – Actuator size 004 to 230



Actuator size 360 to 800



2.2 Automatic valves

with pneumatic actuator bar-agturn®



Type PKI



Type PKN



Type PKO2



Type PKT



Type PKW



Type PMK2



Type PZDS

2/2-way automatic valve – type PKI

Product description



Shut-off valve is made of three stainless steel parts with floating precision ball. The valve is operated pneumatically (double- and single-acting) and is characterised by a long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN15 – DN100
Connection type	inside thread Rp 1/2" to Rp 4" acc. to ISO 7-1 alternatively: welding ends acc. to EN 12627:1999
Mounting position	any orientation
Nominal pressure rating	DN 15 – 50: PN 63 DN 65 – 100: PN 50
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball, switching shaft: stainless steel AISI 316 (1.4401) sealing bowl: PTFE switching shaft seal: DN 15 – DN 100 PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full passage
- maintenance-free
- optionally available with end position feedback, position controllers and solenoid valves
- anti-blowout spindle
- usage also with vacuum and high flow velocities
- alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

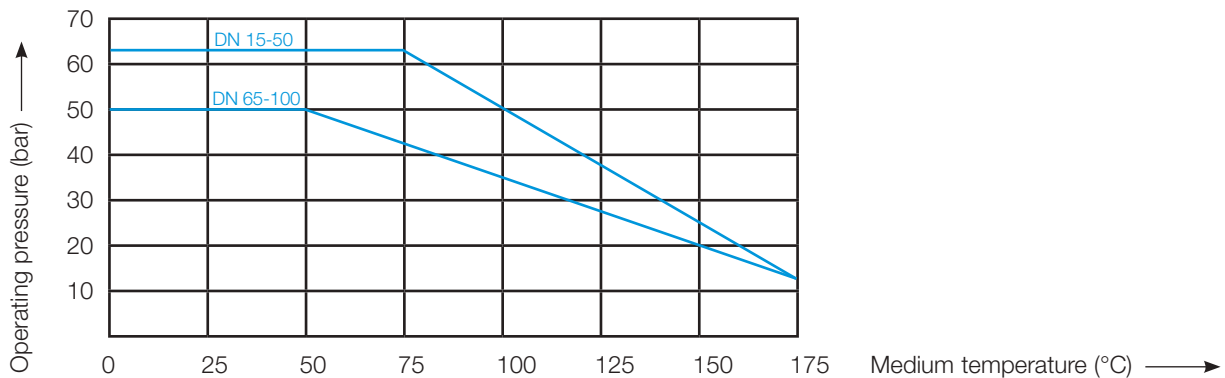


Table of dimensions

Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	SW	Weight (kg)
1/2"	15	032	114	70	146,0	24,5	G 1/8"	/	55	49	36	22	19	/	27	1,29
		040	120		157,0	24	G 1/4"	/	60,5	60				1,46		
		052	147		169,0	48	G 1/4"	74,5	60	72				1,86		
3/4"	20	032	114	77	153,0	24,5	G 1/8"	/	55	49	40	28	24	/	33,5	1,50
		040	120		164,0	24	G 1/4"	/	60,5	60				1,67		
		052	147		176,0	48	G 1/4"	74,5	60	72				2,07		
		063	165		196,0	61	G 1/4"	83	72	88				2,77		
1/0"	25	040	120	92	177,0	24	G 1/4"	/	60,5	60	47	34	30	15	40	2,23
		052	147		189,0	48	G 1/4"	74,5	60	72				2,63		
		063	165		205,0	61	G 1/4"	83	72	88				3,33		
		075	182		216,5	73,3	G 1/4"	95	84	99,5				3,88		
5/4"	32	052	147	105	197,0	48	G 1/4"	74,5	60	72	51	43	38	9	50	3,11
		063	165		213,0	61	G 1/4"	83	72	88				3,81		
		075	182		224,5	73,3	G 1/4"	95	84	99,5				4,36		
		083	208		234,0	80	G 1/4"	103	92	109				5,06		
3/2"	40	063	165	120	225,0	61	G 1/4"	83	72	88	60	49	41,5	12	57	4,67
		083	208		246,0	80	G 1/4"	103	92	109				5,92		
		092	262		253,5	91	G 1/4"	109,5	102	116,5				7,91		
2/0"	50	063	165	140	244,0	61	G 1/4"	83	72	88	69	61	54	12	72	6,30
		075	182		255,5	73,3	G 1/4"	95	84	99,5				6,85		
		083	208		265,0	80	G 1/4"	103	92	109				7,55		
		092	262		272,5	91	G 1/4"	109,5	102	116,5				9,54		
		083	208		316,0	80	G 1/4"	103	92	109				11,75		
5/2"	65	092	262	185	323,5	91	G 1/4"	109,5	102	116,5	110	77	69	9	85	13,74
		105	270		340,0	99,5	G 1/4"	124,5	115	133				14,56		
					362,0	127	G 1/4"	142	135	155				18,50		

Table of dimensions (continuation)

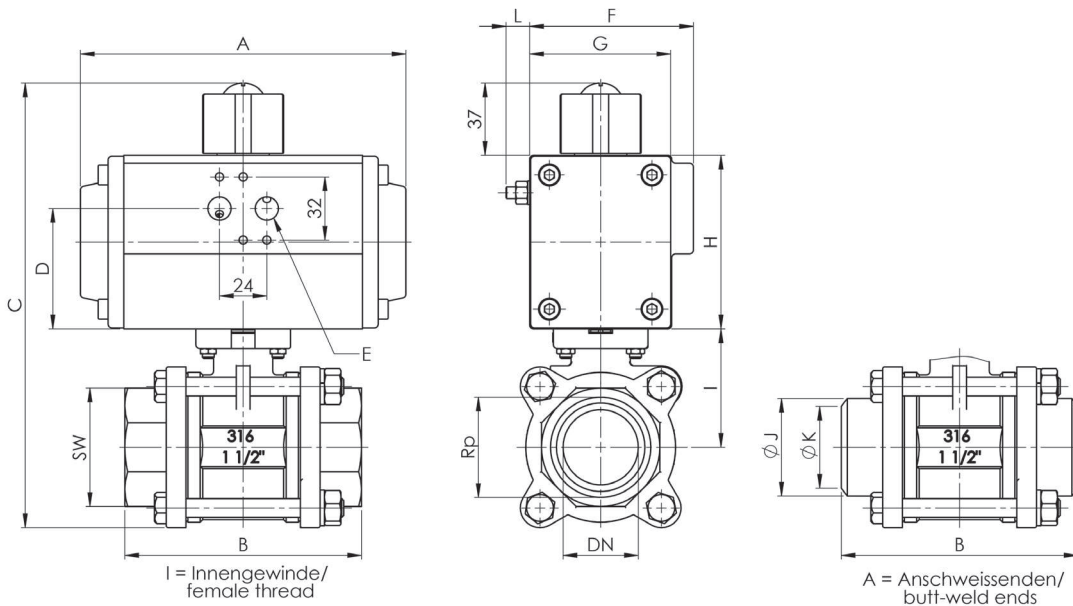
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	SW	Weight (kg)
3/0"	80	092	262	205	338,0	91	G 1/4"	109,5	102	116,5	118	90	84	9	100	17,54
		105	270		355,0	99,5	G 1/4"	124,5	115	133				7,5		18,36
		125	301		377,0	127	G 1/4"	142	135	155				8,5		22,30
		140	395		394,0	138	G 1/4"	/	152	172				7		26,32
4/0"	100	105	270	240	398,0	99,5	G 1/4"	124,5	115	133	133	116	107	7,5	130	27,66
		125	301		420,0	127	G 1/4"	142	135	1055				8,5		31,60
		140	395		437,0	138	G 1/4"	/	152	172				7		35,62
		160	454		462,0	159,5	G 1/4"	/	174	197				6		46,12

Actuator assignment

GD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GD-040	GD-032
3/4"	20	GD-040	GD-032
1/0"	25	GD-052	GD-040
5/4"	32	GD-063	GD-052
3/2"	40	GD-063	GD-063
2/0"	50	GD-075	GD-063
5/2"	65	GD-092	GD-083
3/0"	80	GD-105	GD-092
4/0"	100	GD-125	GD-105

GS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GS-052-08	GS-052-10
3/4"	20	GS-063-08	GS-052-12
1/0"	25	GS-075-08	GS-063-12
5/4"	32	GS-083-07	GS-063-12
3/2"	40	GS-092-07	GS-083-10
2/0"	50	GS-092-08	GS-083-12
5/2"	65	GS-125-08	GS-105-12
3/0"	80	GS-140-08	GS-125-12
4/0"	100	GS-160-07	GS-140-10

Dimensional drawing



Ordering code

PKI-	1/0-	I-	025-	C	GS-063-	12
	Connection dimension in inches	Connection: I = Inside thread A = Welding ends	Nominal size	Spring effect: C = Spring force closing A = Spring force opening (not applicable for double-acting design)	Actuator designation	Spring code (not applicable for double-acting design)

2/2-way automatic valve – type PKN

Product description



Shut-off valve is made of stainless steel with floating precision ball. The valve is operated pneumatically (double- or single-acting) and is characterised by a long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN15 – DN50
Connection type	inside thread Rp 1/2" to Rp 2" acc. to ISO 7-1
Mounting position	any orientation
Nominal pressure rating	PN 100
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) switching shaft: stainless steel AISI 316 (1.4401) sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- full passage
- maintenance-free
- optionally available with end position feedback, position controllers and solenoid valves
- anti-blowout spindle
- usage also with vacuum and high flow velocities
- alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

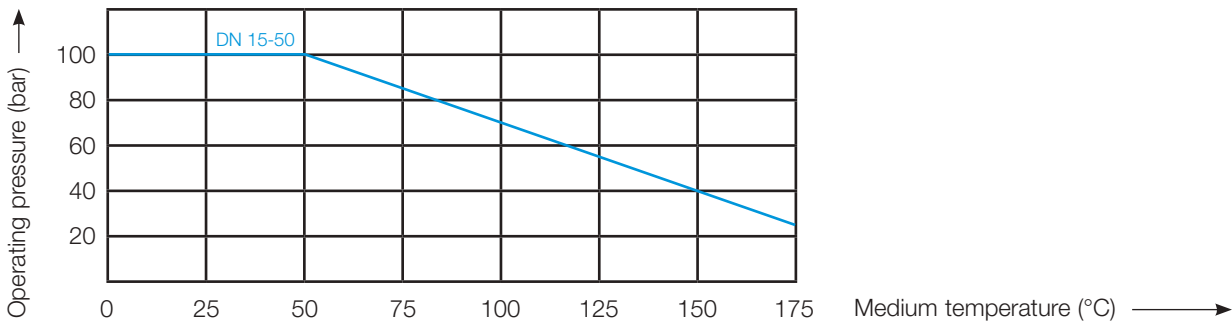


Table of dimensions

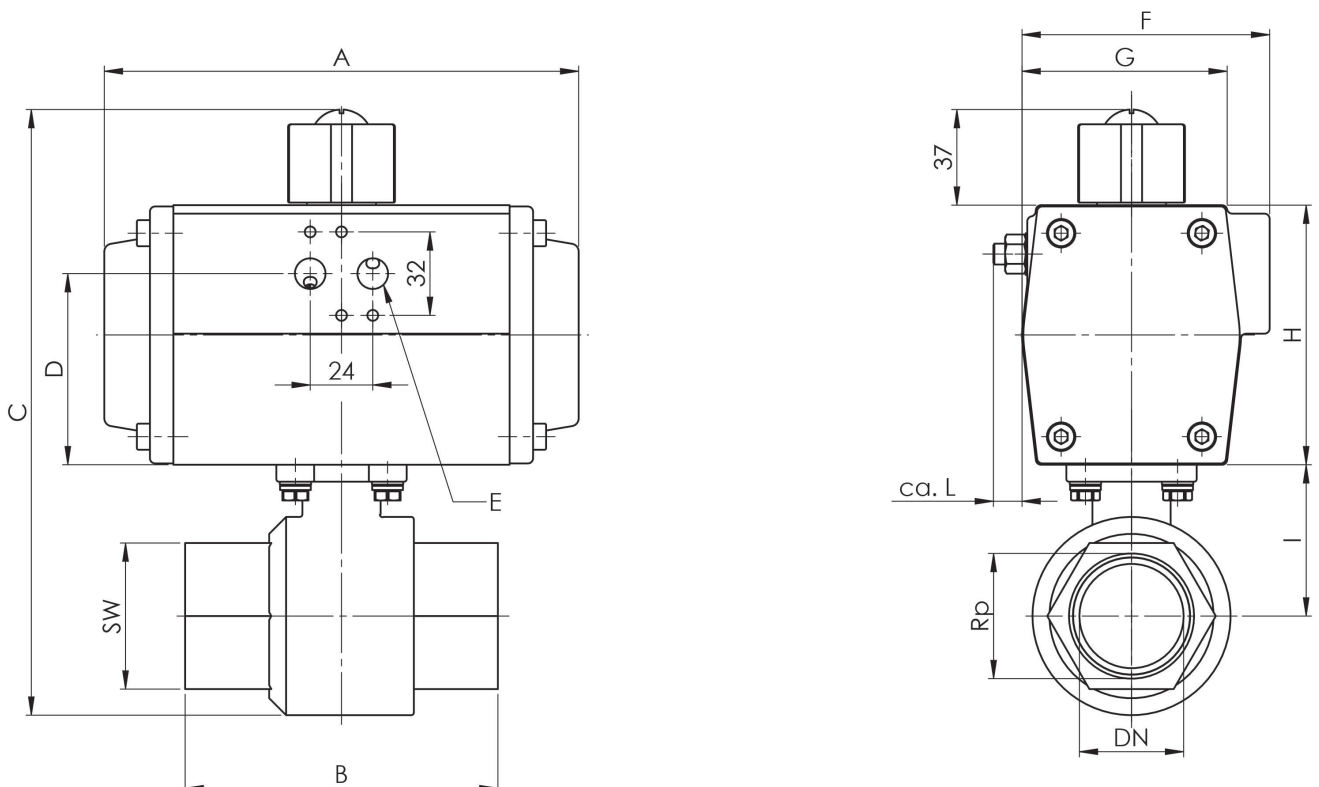
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	L	SW	Weight (kg)
1/2"	15	040	120	60	150	24	G 1/4"	/	60,5	60	36	15	26	1,22
		052	147		162	48	G 1/4"	74,5	60	72		1,62		
		063	165		182	61	G 1/4"	83	72	88		2,32		
3/4"	20	052	147	70	170	48	G 1/4"	74,5	60	72	39,5	9	32	1,76
		063	165		190	61	G 1/4"	83	72	88		2,46		
		075	182		201	73	G 1/4"	95	84	99,5		3,01		
1/0"	25	052	147	90	179	48	G 1/4"	74,5	60	72	44	9	41	2,14
		063	165		195	61	G 1/4"	83	72	88		2,84		
		075	182		207	73	G 1/4"	95	84	99,5		3,39		
		083	208		216	80	G 1/4"	103	92	109		4,09		
5/4"	32	063	165	110	208	61	G 1/4"	83	72	88	51	12	50	3,32
		075	182		220	73	G 1/4"	95	84	99,5		3,87		
		083	208		229	80	G 1/4"	103	92	109		4,57		
		092	262		237	91	G 1/4"	109,5	102	116,5		6,56		
3/2"	40	075	182	120	233	73	G 1/4"	95	84	99,5	58	11	56	4,49
		083	208		242	80	G 1/4"	103	92	109		5,19		
		092	262		250	91	G 1/4"	109,5	102	116,5		7,18		
		105	270		271	99,5	G 1/4"	124,5	115	133		8,00		
2/0"	50	075	182	140	253	73	G 1/4"	95	84	99,5	68	11	69	6,15
		083	208		262	80	G 1/4"	103	92	109		6,85		
		105	270		386	99,5	G 1/4"	124,5	115	133		8,84		
		125	301		308	127	G 1/4"	142	135	155		9,66		

Actuator assignment

GD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GD-052	GD-040
3/4"	20	GD-052	GD-052
1/0"	25	GD-063	GD-052
5/4"	32	GD-075	GD-063
3/2"	40	GD-083	GD-075
2/0"	50	GD-083	GD-075

GS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GS-063-08	GS-063-08
3/4"	20	GS-075-08	GS-063-12
1/0"	25	GS-083-08	GS-075-12
5/4"	32	GS-092-08	GS-083-10
3/2"	40	GS-105-08	GS-092-12
2/0"	50	GS-125-08	GS-105-12

Dimensional drawing



Ordering code

PKN-	1/0-	025-	C	GS-075-	12
	Connection dimension in inches	Nominal size	Spring effect: C = Spring force closing A = Spring force opening (not applicable for double-acting design)	Actuator description	Spring code (not applicable for double-acting design)

2/2-way automatic valve – type PKO2

Product description



Shut-off valve is made of brass with floating precision ball. The valve is operated pneumatically (double- or single-acting) and is characterised by a long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN12 – DN80
Connection type	inside thread G 1/2" to G 3" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 12 – 25: PN 40 DN 32: PN 32 DN 40 – 65: PN 30 DN 80: PN 25
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C (high temperature design)
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- Full passage
- Maintenance-free
- Optionally available with end position feedback, position controllers and solenoid valves
- Anti-blowout spindle
- Usage also with vacuum and high flow velocities
- Alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

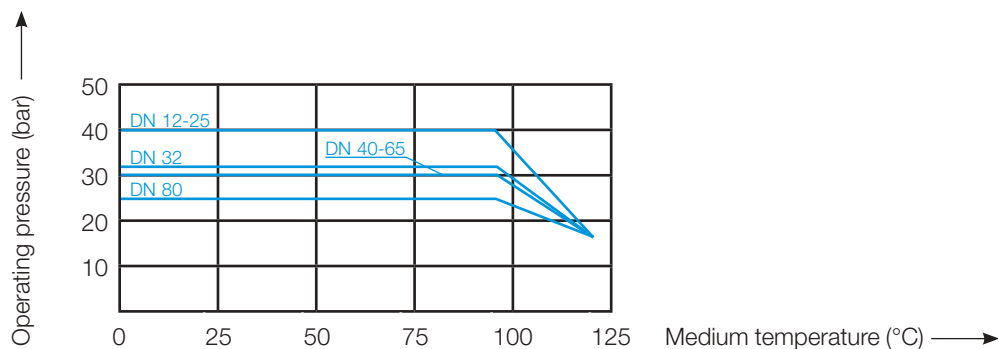


Table of dimensions

Thread „G“	DN	Actuator	A	B	C	D	E	F	G	H	I	L	SW	Weight (kg)
1/4"	12	032	114	64	130,5	24,5	G 1/8"	/	55	49	29	/	26	1,07
		052	147		153,5	48	G 1/4"	74,5	60	72		9		1,64
3/8"	15	032	114	64	130,5	24,5	G 1/8"	/	55	49	29	/	26	1,01
		052	147		153,5	48	G 1/4"	74,5	60	72		9		1,58
1/2"	15	032	114	64	130,5	24,5	G 1/8"	/	55	49	29	/	26	1,01
		052	147		153,5	48	G 1/4"	74,5	60	72		9		1,58
3/4"	20	032	114	76	138,0	24,5	G 1/8"	/	55	49	32,5	/	32	1,14
		052	147		161,0	48	G 1/4"	74,5	60	72		9		1,71
		032	114		146,0	24,5	G 1/8"	/	55	49		/		1,44
1/0"	25	040	120	88	157,0	24	G 1/4"	/	60,5	60	37	15	40	1,61
		052	147		169,0	48	G 1/4"	74,5	60	72		9		2,01
		040	120		167,5	24	G 1/4"	/	60,5	60		15		1,85
5/4"	32	052	147	96	179,5	48	G 1/4"	74,5	60	72	42	9	50	2,25
		063	165		195,5	61	G 1/4"	83	72	88		12		2,95
		075	182		207,0	73,3	G 1/4"	95	84	99,5		11		3,50

Table of dimensions (continuation)

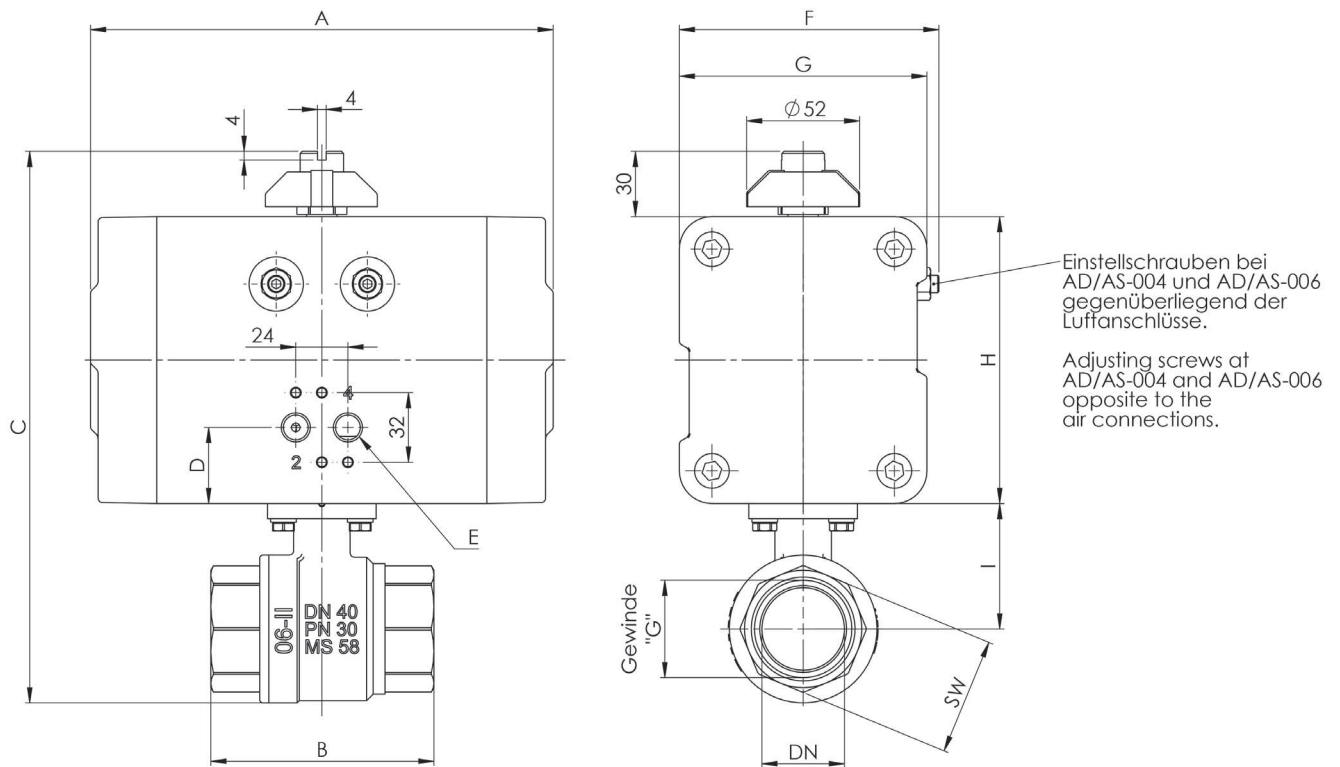
Thread „G“	DN	Actuator	A	B	C	D	E	F	G	H	I	L	SW	Weight (kg)
3/2“	40	052	147	103	201,0	48	G 1/4“	74,5	60	72	58	9	54	2,46
		063	165		217,0	61	G 1/4“	83	72	88		12		3,16
		075	182		228,5	73,3	G 1/4“	95	84	99,5		11		3,71
		083	208		238,0	80	G 1/4“	103	92	109		12		4,41
2/0“	50	052	147	121	214,0	48	G 1/4“	74,5	60	72	64	9	70	3,36
		063	165		230,0	61	G 1/4“	83	72	88		12		4,06
		075	182		241,5	73,3	G 1/4“	95	84	99,5		11		4,61
		083	208		251,0	80	G 1/4“	103	92	109		12		5,31
5/2“	65	063	165	165	270,0	61	G 1/4“	83	72	88	90	12	85	5,85
		083	208		291,0	80	G 1/4“	103	92	109		12		7,10
		092	262		298,5	91	G 1/4“	109,5	102	116,5		9		9,09
3/0“	80	063	165	188	290,0	61	G 1/4“	83	72	88	100	12	100	7,52
		083	208		311,0	80	G 1/4“	103	92	109		12		8,77
		092	262		318,5	91	G 1/4“	109,5	102	116,5		9		10,76

Actuator assignment, at max. differential pressure of 10 bar

GD			
Thread „G“	DN	4 bar actuators	6 bar actuators
1/4“	12	GD-032	GD-032
3/8“	15	GD-032	GD-032
1/2“	15	GD-032	GD-032
3/4“	20	GD-032	GD-032
1/0“	25	GD-040	GD-032
5/4“	32	GD-052	GD-040
3/2“	40	GD-063	GD-052
2/0“	50	GD-063	GD-052
5/2“	65	GD-063	GD-063
3/0“	80	GD-063	GD-063

GS			
Thread „G“	DN	4 bar actuators	6 bar actuators
1/4“	12	GS-052-06	GS-052-06
3/8“	15	GS-052-06	GS-052-06
1/2“	15	GS-052-06	GS-052-06
3/4“	20	GS-052-08	GS-052-08
1/0“	25	GS-052-08	GS-052-10
5/4“	32	GS-075-08	GS-063-12
3/2“	40	GS-083-08	GS-075-12
2/0“	50	GS-083-08	GS-075-12
5/2“	65	GS-092-08	GS-083-10
3/0“	80	GS-092-08	GS-083-10

Dimensional drawing



Ordering code

PKO2-	1/0-	025-	C	GS-052-	10
	Connection dimension in inches	Nominal size	Spring effect: C = Spring force closing A = Spring force opening (not applicable for double-acting design)	Actuator designation	Spring code (not applicable for double-acting design)

3/2-way automatic-valve – type PKT

Product description



Multi-way valve is made of stainless steel with floating precision ball. The valve is operated pneumatically (double- or single-acting) and is characterised by a long service life and high operational safety.

Technical data of 3/2-way ball valve

Technical data	
Nominal size	DN12 – DN38
Connection type	inside thread Rp 1/2" to Rp 2" acc. to ISO 7-1
Mounting position	any orientation
Nominal pressure rating	DN 12 – 20: PN 63 DN 25 – 38: PN 50
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) switching shaft: stainless steel AISI 316 (1.4401) sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- Reduced passage
- 4-fold bearing of the ball in half-shells
- Maintenance-free
- Optionally available with end position feedback, position controllers and solenoid valves
- Anti-blowout spindle
- Usage also with vacuum and high flow velocities
- Alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

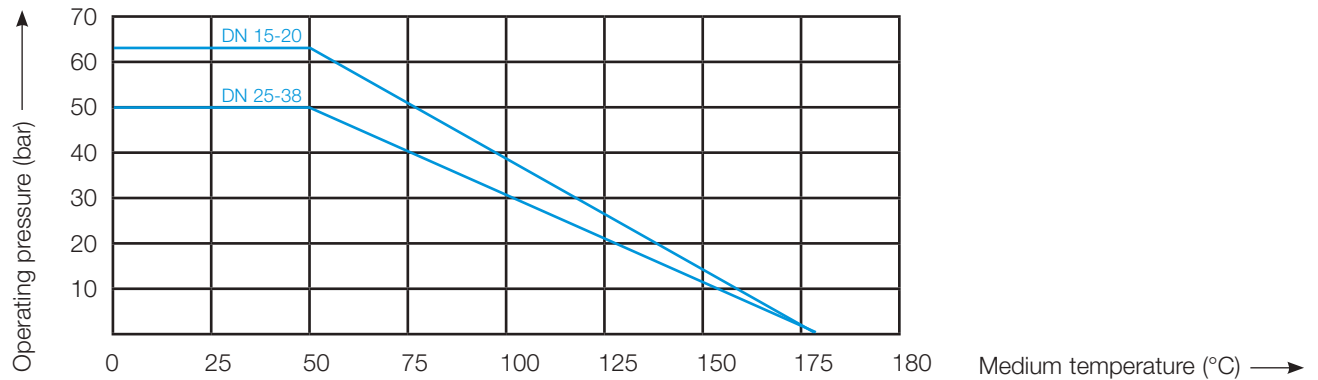


Table of dimensions

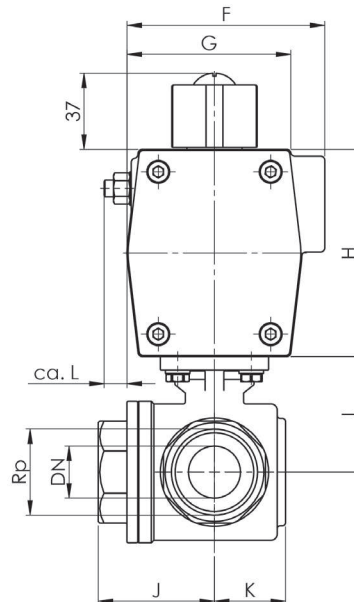
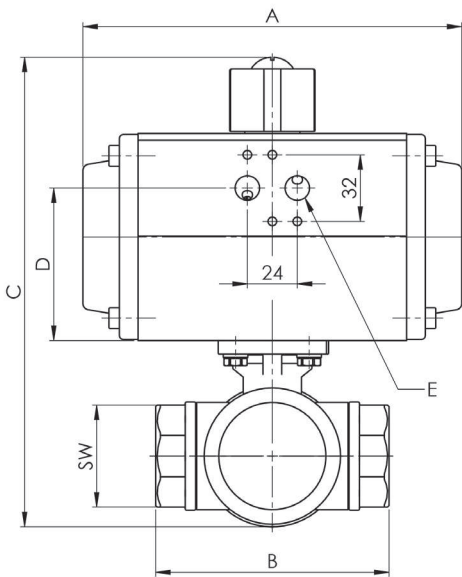
Rp	DN	Actuator	A	B	C	D	E	F	G	H	I	J	K	L	SW	Weight (kg)
1/2"	12	052	147	72	168.0	48	G 1/4"	74.5	60	72	38.5	36	20	9	28	1.94
		063	165		188.0	61	G 1/4"	83	72	88				12		2.64
		075	182		199.0	73.3	G 1/4"	95	84	99.5				11		3.19
3/4"	15	052	147	83	173.0	48	G 1/4"	74.5	60	72	41	41.5	23	9	32.5	2.15
		063	165		193.0	61	G 1/4"	83	72	88				12		2.85
		075	182		205.0	73.3	G 1/4"	95	84	99.5				11		3.40
		083	208		214.0	80	G 1/4"	103	92	109				12		4.10
1/0"	20	052	147	99	186.0	48	G 1/4"	/	74.5	72	49	49.5	28	9	41	2.76
		063	165		202.0	61	G 1/4"	74.5	83	88				12		3.46
		075	182		214.0	73.3	G 1/4"	83	95	99.5				11		4.01
		083	208		223.0	80	G 1/4"	95	103	109				12		4.71
5/4"	25	063	165	112	214.0	61	G 1/4"	83	72	88	55	56	34.5	12	49.5	4.18
		075	182		226.0	73	G 1/4"	95	84	99.5				11		4.73
		083	208		235.0	80	G 1/4"	103	92	109				12		5.43
		092	262		248.0	91	G 1/4"	109.5	102	116.5				9		7.42
		105	270		269.0	99.5	G 1/4"	124.5	115	133				7.5		8.24
3/2"	32	083	208	125	248.0	80	G 1/4"	103	92	109	63	62.5	37.5	12	56.5	6.53
		092	262		256.0	91	G 1/4"	109.5	102	116.5				9		8.52
		105	270		272.0	99.5	G 1/4"	124.5	115	133				7.5		9.34
		125	301		294.0	127	G 1/4"	142	135	155				8.5		13.28
		092	262		276.0	91	G 1/4"	109.5	102	116.5				9		10.48
2/0"	38	105	270	149	292.0	99.5	G 1/4"	124.5	115	133	74	74.5	48	7.5	69.5	11.30
		125	301		314.0	127	G 1/4"	124	135	155				8.5		15.24
		140	395		337.0	138	G 1/4"	/	152	172				7		19.26

Actuator assignment

GD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GD-052	GD-052
3/4"	15	GD-063	GD-052
1/0"	20	GD-063	GD-052
5/4"	25	GD-083	GD-063
3/2"	32	GD-092	GD-083
2/0"	38	GD-105	GD-092

GS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GS-075-09	GS-063-12
3/4"	15	GS-083-08	GS-075-10
1/0"	20	GS-083-08	GS-075-12
5/4"	25	GS-105-08	GS-092-10
3/2"	32	GS-125-08	GS-105-12
2/0"	38	GS-140-08	GS-125-12

Dimensional drawing



Ordering code

PKT-	1/0-	T2-	020-	GS-075-	12
	Connection dimension in inches	Switching position (see diagram below)	Nominal size	Actuator description	Spring code (not applicable for double-acting design)

Switching position diagram

Ball bore		T				L
Position	0°					
	90°					
Switch position		T1	T2	T3	T4	L4

2/2-way automatic-valve – type PKW

Product description



Shut-off valve is made of stainless steel with floating precision ball. The valve is operated pneumatically (double- and single-acting) and is characterised by a long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN15 – DN100
Connection type	intermediate flange connection acc. to DIN EN 1092
Mounting position	any orientation
Nominal pressure rating	DN 15 – 50, DN 80: PN 40 DN 65, DN 100: PN 16
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) switching shaft: stainless steel AISI 316 (1.4401) sealing bowl: PTFE switching shaft seal: PTFE
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- Full passage
- Maintenance-free
- Optionally available with end position feedback, position controllers and solenoid valves
- Anti-blowout spindle
- Usage also with vacuum and high flow velocities
- Alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

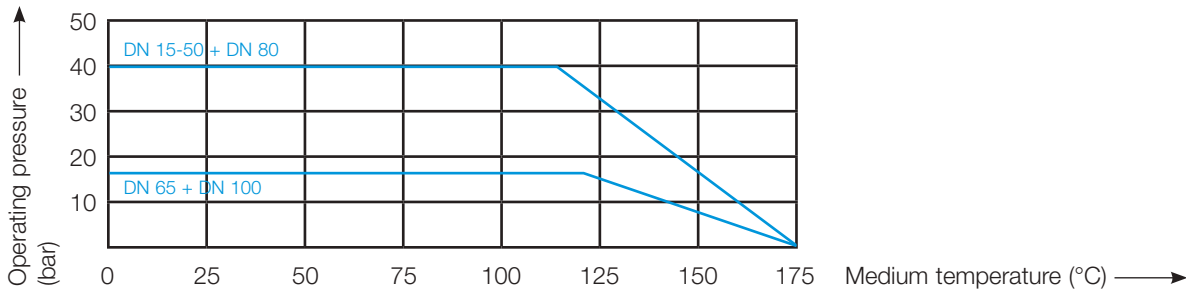


Table of dimensions

Inch	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	M/M1	N	Weight (kg)
1/2"	15	032	114	41	135.0	24.5	G 1/8"	/	55	49	49	81	65	4 x M12	16/2	/	1.96
		040	120		146.0	24	G 1/4"	/	60.5	60						15	2.13
		052	147		158.0	48	G 1/4"	74.5	60	72						9	2.53
		063	165		178.0	61	G 1/4"	83	72	88						12	3.23
3/4"	20	032	114	44	140.0	24.5	G 1/8"	/	55	49	54	99	75	4 x M12	18/2	/	2.66
		040	120		151.0	24	G 1/4"	/	60.5	60						15	2.83
		052	147		163.0	48	G 1/4"	74.5	60	72						9	3.23
		063	165		183.0	61	G 1/4"	83	72	88						12	3.93
1/0"	25	052	147	50	174.0	48	G 1/4"	74.5	60	72	65	115	85	4 x M12	18/2	9	3.94
		063	165		190.0	61	G 1/4"	83	72	88						12	4.64
		075	182		202.0	73.3	G 1/4"	95	84	99.5						11	5.19
5/4"	32	083	208	60	211.0	80	G 1/4"	103	92	109	77	140	100	4 x M16	18/2	12	5.89
		063	165		202.0	61	G 1/4"	83	72	88						12	6.12
		083	208		223.0	80	G 1/4"	103	92	109						11	7.37
3/2"	40	063	165	65	211.0	61	G 1/4"	83	72	88	86	150	110	4 x M16	18/3	12	7.40
		075	182		223.0	73.3	G 1/4"	95	84	99.5						11	7.95
		083	208		232.0	80	G 1/4"	103	92	109						12	8.65
		092	262		240.0	91	G 1/4"	109.5	102	116.5						9	10.64
2/0"	50	075	182	80	230.0	73	G 1/4"	95	84	99.5	93	165	125	4 x M16	20/3	11	9.08
		083	208		239.0	80	G 1/4"	103	92	109						12	9.78
		092	262		247.0	91	G 1/4"	109.5	102	116.5						9	11.77
		105	270		263.0	99.5	G 1/4"	124.5	115	133						7.5	12.59
5/2"	65	083	208	110	256.0	80	G 1/4"	103	92	109	110	185	145	4 x M16	22/3	12	14.78
		092	262		264.0	91	G 1/4"	109.5	102	116.5						9	16.77
		125	301		302.0	127	G 1/4"	142	135	155						8.5	21.53
		140	395		319.0	138	G 1/4"	/	152	172						7	25.55

Table of dimensions (continuation)

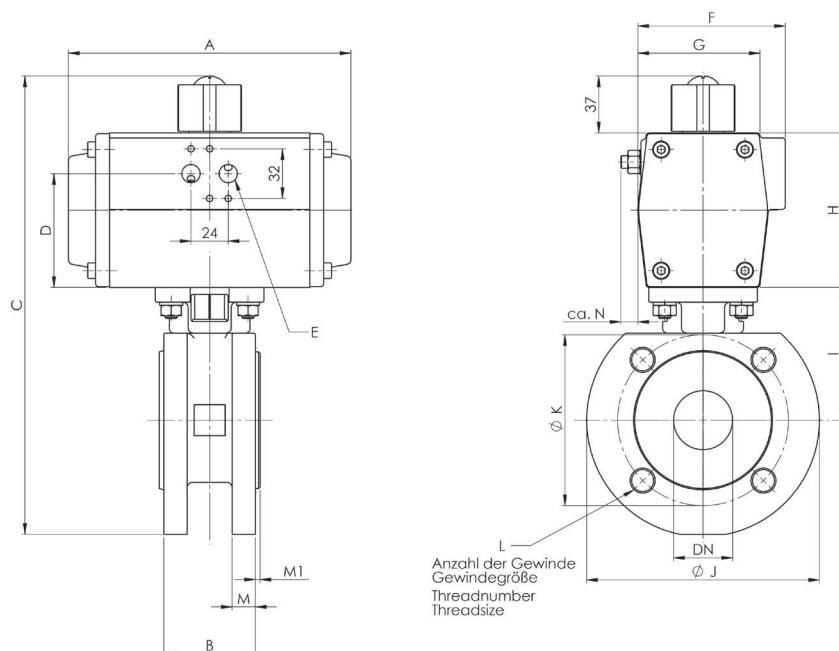
Inch	DN	Actuator	A	B	C	D	E	F	G	H	I	øJ	øK	L	M/M1	N	Weight (kg)
3/0"	80	092	262	120	274.0	91	G 1/4"	109.5	102	116.5	120	200	160	8 x M16	24/3	9	19.63
		105	270		290.0	99.5	G 1/4"	124.5	115	133						7.5	20.45
		125	301		312.0	127	G 1/4"	142	135	155						8.5	24.39
		140	395		329.0	138	G 1/4"	/	152	172						7	28.41
4/0"	100	105	270	150	302.0	99.5	G 1/4"	124.5	115	133	132	220	180	8 x M16	20/3	7.5	25.96
		125	301		324.0	127	G 1/4"	142	135	155						8.5	29.90
		140	395		341.0	138	G 1/4"	/	152	172						7	33.92

Actuator assignment

GD			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GD-040	GD-032
3/4"	20	GD-040	GD-032
1/0"	25	GD-063	GD-052
5/4"	32	GD-063	GD-063
3/2"	40	GD-075	GD-063
2/0"	50	GD-083	GD-075
5/2"	65	GD-092	GD-083
3/0"	80	GD-105	GD-092
4/0"	100	GD-125	GD-105

GS			
Rp	DN	4 bar actuators	6 bar actuators
1/2"	15	GS-063-08	GS-052-12
3/4"	20	GS-063-08	GS-052-12
1/0"	25	GS-083-08	GS-075-12
5/4"	32	GS-083-08	GS-083-08
3/2"	40	GS-105-08	GS-092-10
2/0"	50	GS-105-08	GS-092-12
5/2"	65	GS-140-06	GS-125-10
3/0"	80	GS-140-08	GS-125-12
4/0"	100	GS-140-08	GS-140-10

Dimensional drawing



Ordering code

PKW-	1/0-	025-	C	GS-075-	12
	Connection dimension in inches	Nominal size	Spring effect: C = Spring force closing A = Spring force opening (not applicable for double-acting design)	Actuator designation	Spring code (not applicable for double-acting design)

3/2-way automatic valve – type PMK2

Product description



Multi-way valve is made of stainless steel with floating precision ball. The valve is operated pneumatically (double- or single-acting) and is characterised by a long service life and high operational safety.

Technical data of 3/2-way ball valve

Technical data	
Nominal size	DN10 – DN50
Connection type	inside thread G 3/8" to G 2" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 10 – 20: PN 30, DN 25 – 32: PN 20, DN 40 – 50: PN 16
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, hard chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard), -20 °C to +160 °C (high temperature design)
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- Full passage
- 4-fold bearing of the ball in half-shells
- Maintenance-free
- Optionally available with end position feedback, position controllers and solenoid valves
- Anti-blowout spindle
- Usage also with vacuum and high flow velocities
- Alternatively also can be delivered with electric rotary actuator, hand lever or gearbox



End position adjustment



Solenoid valve interface

Special designs

Please contact us.

Pressure-temperature diagram

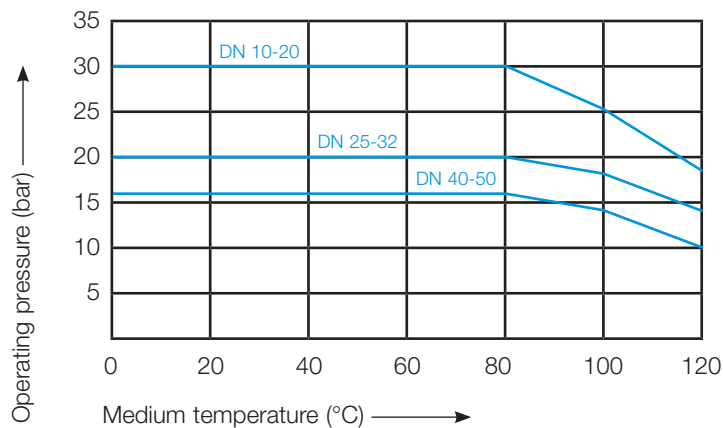


Table of dimensions

Thread „G“	DN	Actuator	A	B	C	D	E	F	G	H	I	J	K	L	SW	Weight (kg)
1/4"	10	032	114	65	131,5	24,5	G 1/8"	/	55	49	30	32,5	18,5	/	22	1,15
		052	147		154,5	48	G 1/4"	74,5	60	72				9		1,72
3/8"	10	032	114	65	131,5	24,5	G 1/8"	/	55	49	30	32,5	18,5	/	22	1,12
		052	147		154,5	48	G 1/4"	74,5	60	72				9		1,69
1/2"	15	032	114	78	137,5	24,5	G 1/8"	/	55	49	33	39	22,5	/	27	1,30
		052	147		160,5	48	G 1/4"	74,5	60	72				9		1,87
3/4"	20	040	120	87	161,5	24	G 1/4"	/	60,5	60	42	43,5	26,5	/	32	1,78
		052	147		173,5	48	G 1/4"	74,5	60	72				9		2,18
		063	165		189,5	61	G 1/4"	83	72	88				12		2,88
		075	182		201,0	73,3	G 1/4"	95	84	99,5				11		3,43
1/0"	25	052	147	105	184,0	48	G 1/4"	74,5	60	72	47	52,5	32,5	/	40	2,77
		063	165		200,0	61	G 1/4"	83	72	88				12		3,47
		075	182		211,5	73,3	G 1/4"	95	84	99,5				11		4,02
		083	208		221,0	80	G 1/4"	103	92	109				12		4,72
5/4"	32	052	147	118	193,0	48	G 1/4"	74,5	60	72	52	59	36,5	/	49	3,29
		063	165		209,0	61	G 1/4"	83	72	88				12		3,99
		075	182		220,5	73,3	G 1/4"	95	84	99,5				11		4,54
		083	208		230,0	80	G 1/4"	103	92	109				12		5,24

Table of dimensions (continuation)

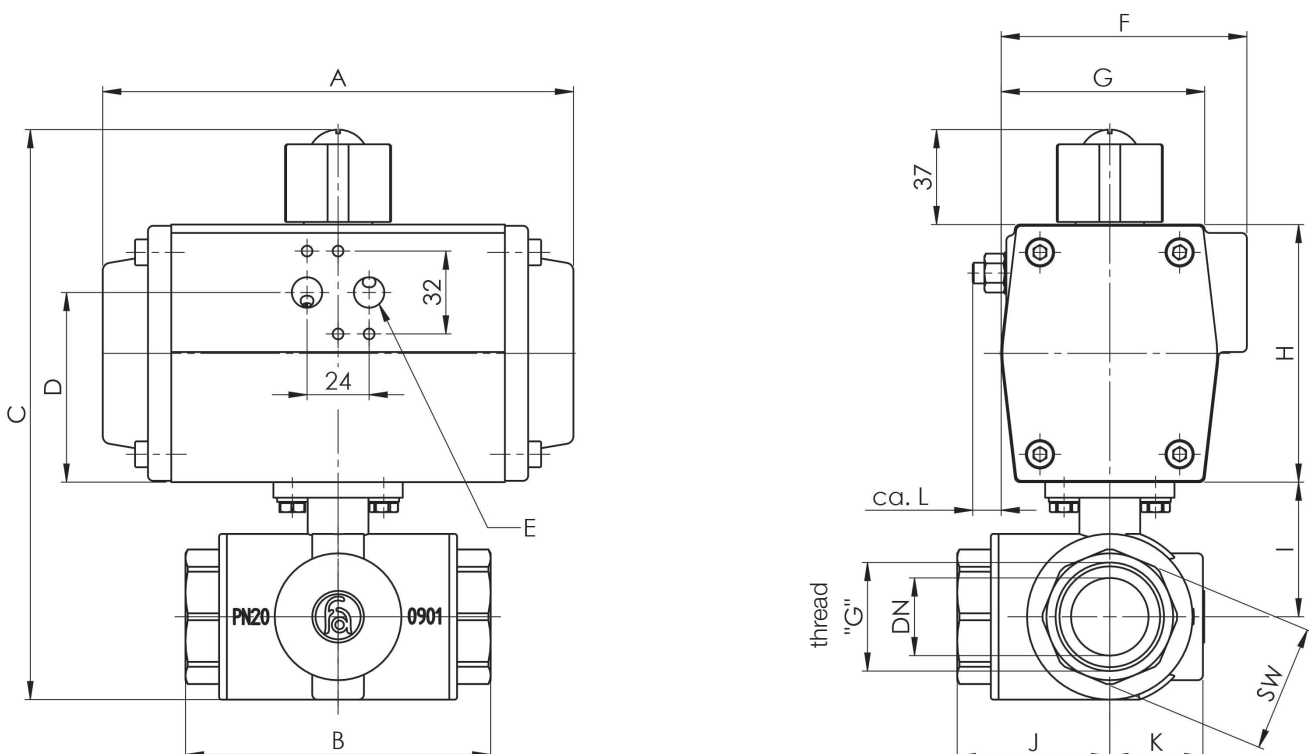
Thread „G“	DN	Actuator	A	B	C	D	E	F	G	H	I	J	K	L	SW	Weight (kg)
3/2“	40	063	165	134	235,0	61	G 1/4“	83	72	88	70	67	43,5	12	54	5,64
		083	208		256,0	80	G 1/4“	103	92	109				12		6,89
		092	262		263,5	91	G 1/4“	109,5	102	116,5				9		8,88
2/0“	50	063	165	161	254,0	61	G 1/4“	83	72	88	79,5	80,5	54,5	12	67	8,15
		075	182		265,5	73,3	G 1/4“	95	84	99,5				11		8,70
		083	208		275,0	80	G 1/4“	103	92	109				12		9,40
		092	262		282,5	91	G 1/4“	109,5	102	116,5				9		11,39

Actuator assignment

GD			
Thread „G“	DN	4 bar actuators	6 bar actuators
1/4“	10	GD-032	GD-032
3/8“	10	GD-032	GD-032
1/2“	15	GD-032	GD-032
3/4“	20	GD-052	GD-040
1/0“	25	GD-063	GD-052
5/4“	32	GD-063	GD-052
3/2“	40	GD-063	GD-063
2/0“	50	GD-075	GD-063

GS			
Thread „G“	DN	4 bar actuators	6 bar actuators
1/4“	10	GS-052-06	GS-052-06
3/8“	10	GS-052-06	GS-052-06
1/2“	15	GS-052-08	GS-052-08
3/4“	20	GS-075-08	GS-063-12
1/0“	25	GS-083-07	GS-063-12
5/4“	32	GS-083-07	GS-063-12
3/2“	40	GS-092-08	GS-083-10
2/0“	50	GS-092-08	GS-083-12












Dimensional drawing



Ordering code

PMK2-	1/0-	T2-	025-	GS-063-	12
	Connection dimension in inches	Switching position (see diagram below)	Nominal size	Actuator description	Spring code (not applicable for double-acting design)

Switching position diagram

Ball bore		T				L
Position  clockwise	0°					
	90°					
Switch position		T1	T2	T3	T4	L4

Automatic butterfly valve – type PZDS

Product description



One-piece, anti-blowout, aerodynamically designed, tightly closing and centrally mounted shut-off valve. The automatic shut-off valve is operated pneumatically (double- or single-acting).

Technical data of the shut-off valve

Technical data	
Nominal size	DN 25 to DN 600
Connection type	Flange connection acc. to: EN 1092-1 & EN 1092-2, PN6/10/16/25/40, ASME/ANSI 125/150 BS10-d & BS10-e, JIS B2238 & JIS B2239 (more details upon request)
Mounting position	any orientation
Nominal pressure rating	DN 25: max. 10 bar DN 32 – 350: max. 20 bar DN 400 – 600: max. 6 bar
Structural length	acc. to EN 558-1, series 20 ISO 5752, series 20 API 609 table 2 (except DN 400 - 600)
Temperature range	collar EDPM -15 °C to +120 °C
Materials	casing: DN 25 – gray cast iron GG25 casing: DN 32 – 600 – spheroidal graphite iron GGG40 disc: stainless steel 1.4408 shaft: stainless steel 1.4028 collar: see „temperature range”
Flow media	compare material resistance table
Flow direction	any direction

Technical data of drive GD/GS

Technical data	
Control pressure	2 to 8 bar
Control medium/quality	air or neutral gases (other media on request) acc. to DIN ISO 8573-1 Class 4 (minimum requirement)
Ambient temperature	-20 °C to +80 °C (standard) -20 °C to +160 °C (high temperature design)
Actuation	pneumatically double- or single-acting
End position adjustment	+5° to -5° adjustable in both end positions
Interfaces	acc. to EN ISO 5211 and VDI/VDE 3845
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010

Product features

- conformity directive 97/23/CE PED
- conformity directive 94/9/CE ATEX
- tightness test acc. to EN12266-1
- anti-static test acc. to EN12266-2
- very good force transmission due to robust multiple toothing between shaft and valve disc
- easy maintenance and anti-blowout shaft due to circlip
- exchangeable disc and collar
- shaft and casing without contact with medium
- self-lubricating bearing bushes
- casing 80 µm epoxy coated
- casing color RAL 5017 blue
- collar NBR, FKM, silicone, EPDM
- white on request
- optionally available with end position feedback, solenoid valves and position controllers
- on request can be used with vacuum
- alternatively can also be used with detent lever, gearbox or electric actuator



End position adjustment



Solenoid valve interface

Table of dimensions

DN	Actuator size	A	B	C	D	E	F	G	H	I	J	L	Weight (kg)
40	040	120	32	284	24	G 1/4"	/	60,5	60	130	/	15	2,60
	052	147		296	48	G 1/4"	74,5	60	72		/	9	3,00
	063	165		312	61	G 1/4"	83	72	88		/	12	3,70
50	052	147	43	307	48	G 1/4"	74,5	60	72	136	/	9	3,90
	063	165		323	61	G 1/4"	83	72	88		/	12	4,60
	075	182		334,5	73,3	G 1/4"	95	84	99,5		/	11	5,15
65	052	147	46	338	48	G 1/4"	74,5	60	72	145	/	9	3,90
	063	165		354	61	G 1/4"	83	72	88		/	12	4,60
	075	182		365,5	73,3	G 1/4"	95	84	99,5		/	11	5,15
	083	208		375	80	G 1/4"	103	92	109		/	12	5,85
80	063	165	46	365	61	G 1/4"	83	72	88	151	/	12	5,60
	075	182		376,5	73,3	G 1/4"	95	84	99,5		/	11	6,15
	083	208		386	80	G 1/4"	103	92	109		/	12	6,85
100	075	182	52	417,5	73,3	G 1/4"	95	84	99,5	175	/	11	6,95
	083	208		427	80	G 1/4"	103	92	109		/	12	7,65
	092	262		434,5	91	G 1/4"	109,5	102	116,5		/	9	9,64
	105	270		456	99,5	G 1/4"	124,5	115	133		/	7,5	10,46
125	075	182	56	446,5	73,3	G 1/4"	95	84	99,5	190	/	11	8,85
	083	208		456	80	G 1/4"	103	92	109		/	12	9,55
	092	262		463,5	91	G 1/4"	109,5	102	116,5		/	9	11,54
	105	270		480	99,5	G 1/4"	124,5	115	133		/	7,5	12,36
150	083	208	56	480	80	G 1/4"	103	92	109	203	/	12	10,55
	092	262		487,5	91	G 1/4"	109,5	102	116,5		/	9	12,54
	105	270		504	99,5	G 1/4"	124,5	115	133		/	7,5	13,36
	125	301		526	127	G 1/4"	142	135	155		/	8,5	17,30
200	105	270	60	560	99,5	G 1/4"	124,5	115	133	225	/	7,5	19,76
	125	301		582	127	G 1/4"	142	135	155		/	8,5	23,70
250	140	395	68	599	138	G 1/4"	/	152	172	271	/	7	27,72
	140	395		676	138	G 1/4"	/	152	172		/	7	34,12
	160	454		701	159,5	G 1/4"	/	174	197		/	6	44,62
300	190	528	78	814	188	G 1/4"	/	206	230	296	80	8,5	55,74
	140	395		743	138	G 1/4"	/	152	172		/	7	43,22
	160	454		768	159,5	G 1/4"	/	174	197		/	6	53,72
350	190	582	78	881	188	G 1/4"	/	206	230	305	80	8,5	65,05
	160	454		809	159,5	G 1/4"	/	174	197		/	6	60,72
	190	528		922	188	G 1/4"	/	206	230		80	8,5	72,05
	210	536		947	205,5	G 1/4"	/	226	255		80	10,5	79,45
400	240	608	102	1002	67,5	G 1/4"	260	160	289	378	100	10,5	99,10
	160	454		898	159,5	G 1/4"	/	174	197		/	6	81,52
	190	528		1011	188	G 1/4"	/	206	230		80	8,5	92,85
	210	536		1036	205,5	G 1/4"	/	226	255		80	10,5	100,25
450	240	608	114	1091	67,5	G 1/4"	260	160	289	417	100	10,5	119,90
	190	528		999	188	G 1/4"	/	206	230		/	8,5	119,40
	210	536		1024	205,5	G 1/4"	/	226	255		/	10,5	126,80
	240	608		1159	67,5	G 1/4"	260	160	289		100	10,5	150,20
500	270	721	127	1198	79	G 1/2"	294	160	328	440	100	13,5	171,90
	210	536		1087	205,5	G 1/4"	/	226	255		/	10,5	116,80
	240	608		1222	67,5	G 1/4"	260	160	289		100	10,5	140,20
	270	721		1261	79	G 1/2"	294	160	328		100	13,5	161,90
600	300	769	154	1281	174	G 1/2"	406	210	348	495	100	/	204,90
	240	608		1337	67,5	G 1/4"	260	160	289		100	10,5	204,20
	270	721		1376	79	G 1/2"	294	160	328		100	13,5	225,90
	300	769		1396	174	G 1/2"	406	210	348		100	/	268,90
	350	909		1456	204	G 1/2"	460	280	408		100	/	359,00

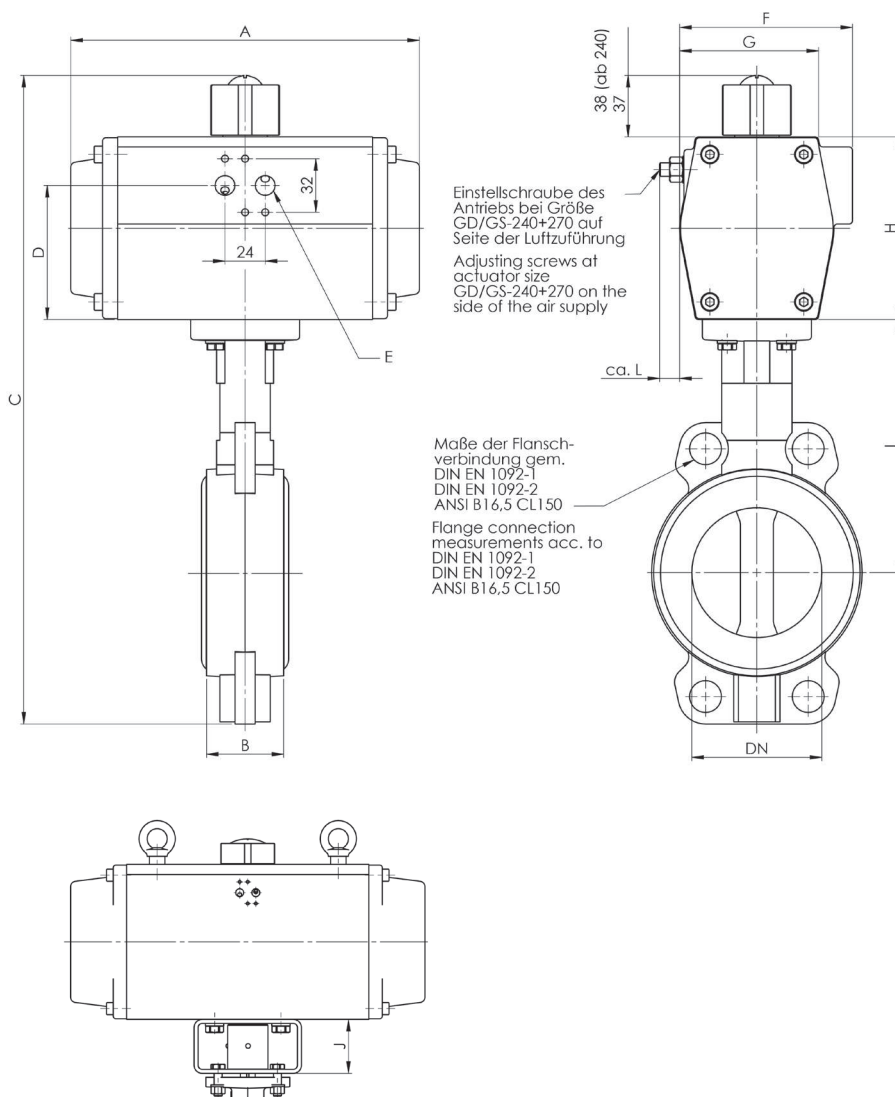
Actuator assignment

GD		
DN	4 bar actuators	6 bar actuators
40	GD-052	GD-040
50	GD-063	GD-052
65	GD-063	GD-052
80	GD-075	GD-063
100	GD-083	GD-075
125	GD-083	GD-075
150	GD-092	GD-083
200	GD-125	GD-105
250	GD-140	GD-140
300	GD-160	GD-140
350	GD-190	GD-160
400	GD-190	GD-160
450	GD-210	GD-190
500	GD-240	GD-210
600	GD-270	GD-240

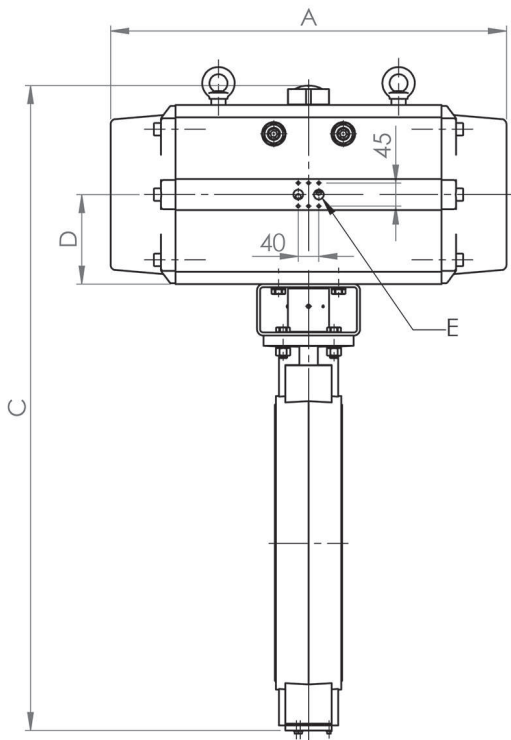
GS spring closed		
DN	4 bar actuators	6 bar actuators
40	GS-063-09	GS-063-10
50	GS-075-09	GS-063-12
65	GS-083-08	GS-075-12
80	GS-083-10	GS-083-12
100	GS-105-08	GS-092-12
125	GS-105-09	GS-105-10
150	GS-125-08	GS-105-12
200	GS-140-08	GS-140-08
250	GS-190-08	GS-160-12
300	GS-190-09	GS-190-10
350	GS-240-08	GS-210-12
400	GS-240-09	GS-240-10
450	GS-270-08	GS-240-12
500	GS-300-09	GS-270-12
600	GS-350-10	GS-350-10

GS spring open		
DN	4 bar actuators	6 bar actuators
40	GS-063-07	GS-052-10
50	GS-075-07	GS-063-10
65	GS-083-08	GS-075-10
80	GS-083-07	GS-075-10
100	GS-105-07	GS-092-10
125	GS-105-07	GS-092-10
150	GS-125-06	GS-105-10
200	GS-140-07	GS-125-10
250	GS-190-06	GS-160-09
300	GS-190-07	GS-190-08
350	GS-240-08	GS-190-10
400	GS-240-07	GS-210-10
450	GS-270-07	GS-240-10
500	GS-300-07	GS-270-10
600	GS-350-07	GS-300-10

Dimensional drawing GD/GS-040-270

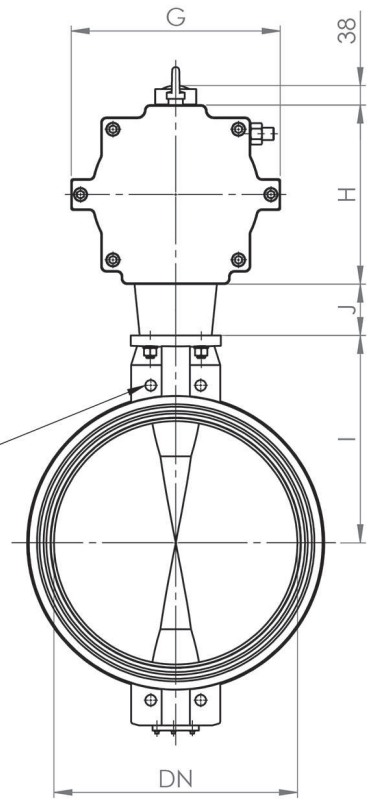


Dimensional drawing GD/GS-300-400



Maße der Flansch-
verbindung gem.
DIN EN 1092-1
DIN EN 1092-2
ANSI B16,5 CL150

Flange connection
measurements acc. to
DIN EN 1092-1
DIN EN 1092-2
ANSI B16,5 CL150



2.3 Automatic valves

with electric actuator STV



Type EKIV



Type EKNV



Type EKO2V



Type EKTIV



Type EKWW



Type EMK2V



Type EZDS

2/2-way electric valve – type EKIV

Product description



Automatic valve in stainless steel, 3-piece-design, with floating precision ball. The valve is electric operated and is characterised by long service life and high operational safety.

Technical data 2/2-way-ball valve

Technical Data	
Nominal size	DN15 – DN80
Connection	female thread Rp 1/2" - Rp 4" acc. ISO 7-1 alternative: butt-weld ends acc. EN 12627:1999
Mounting position	any orientation, but not upside-down
Nominal pressure	DN 15 – 50: PN 63 DN 65 – 80: PN 40
Operating pressure	see pressure-temperature-diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball, stem: stainless steel AISI 316 (1.4401) seal: PTFE stem seal: DN 15 – DN 50 PTFE + FKM, DN 65 – DN 80 PTFE
Flow medium	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical Data	
Connection	ER Premier 90-240V AC (90-350V DC) oder 24V AC/DC ER Plus 90-240V AC (90-350V DC) oder 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambient temperature	-10° C to +55° C
Duty rating	ER Premier 30%, ER Plus 50%
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- maintenance-free
- optic and electronic limit switch enclosed with the delivery standard
- manual override inclusive
- electric torque limit
- applications also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or gear-driven available

Special versions

- failsafe-type
- positioner-type
- ATEX type
- duty rating 80%

Please contact us for technical information.

Pressure-temperature-diagram

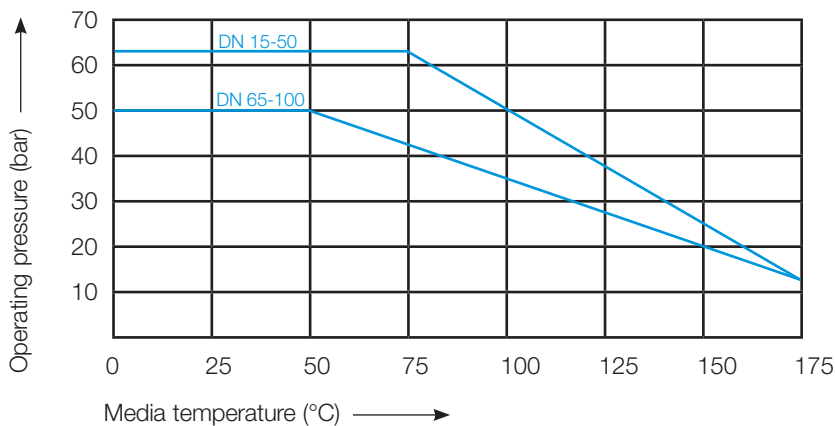
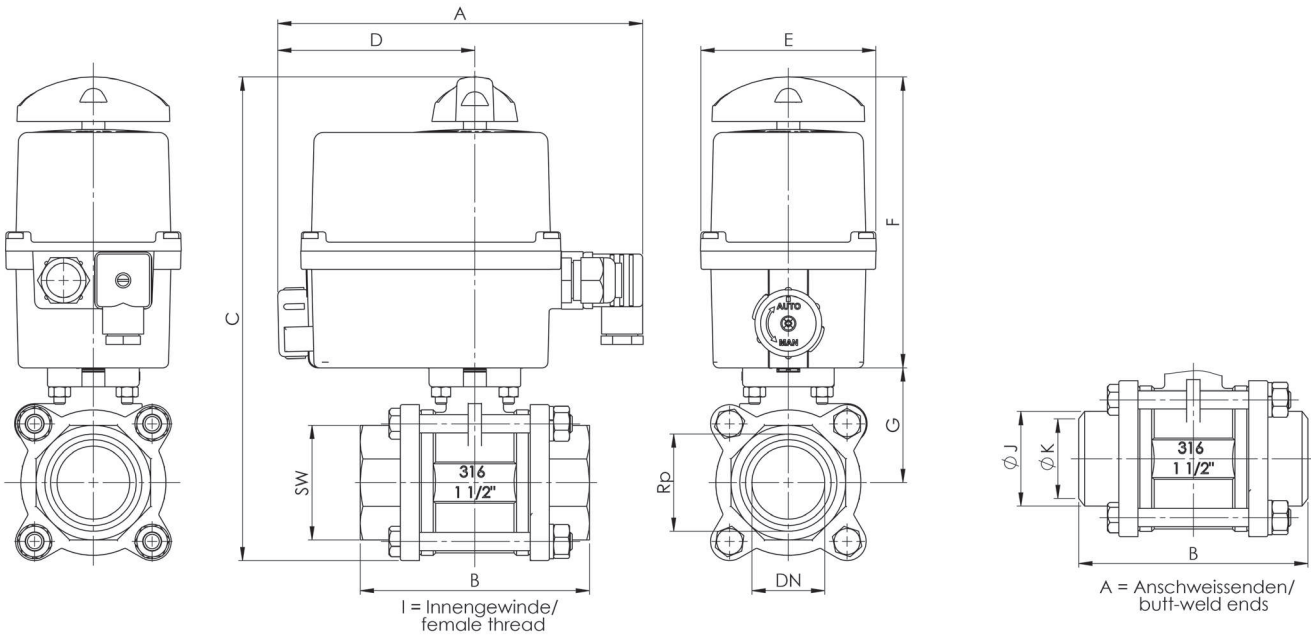


Table of dimension

Rp	DN	Actuator size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	øJ (mm)	øK (mm)	SW (mm)	Weight (kg)
1/2"	15	ER10	191	70	212	103	92	152	36	22	19	27	2,00
3/4"	20	ER10	191	77	219	103	92	152	40	28	24	33,5	2,21
1/0"	25	ER20	191	92	232	103	92	152	47	34	30	40	2,77
5/4"	32	ER20	191	105	240	103	92	152	51	43	38	50	3,25
3/2"	40	ER35	191	120	252	103	92	152	60	49	41,5	57	4,11
2/0"	50	ER35	191	140	271	103	92	152	69	61	54	72	5,74
5/2"	65	ER100	205	185	346	106	128	176	110	77	69	85	10,97
3/0"	80	ER100	205	205	361	106	128	176	118	90	84	100	14,77
4/0"	100	ER100	205	240	404	106	128	176	133	116	107	130	24,07

Dimensions



Ordering code

EKIV-	1/0-	I-	025-	ER20-X0A-M00-90-240V AC/DC
	Connection size in inch	Connection: I = female thread; A = butt-weld end	Nominal size	Actuator identification (M00 = ER Premier, G00 = ER Plus)

2/2-way electric valve – type EKNV

Product description



Automatic valve in stainless steel with floating precision ball. The valve is electrically operated and is characterised by long service life and high operational safety.

Technical data 2/2-way-ball valve

Technical data	
Nominal size	DN15 – DN50
Connection	female thread Rp 1/2" to Rp 2" acc. ISO 7-1
Mounting position	any orientation
Nominal pressure	PN100
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 180 °C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE+ FKM
Flow material	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical data	
Voltage	ER Premier 90-240V AC (90-350V DC) oder 24V AC/DC ER Plus 90-240V AC (90-350V DC) oder 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambiant temperature	-10° C to + 55° C
Duty rating	30% ER Premier, 50% ER Plus
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- maintenance-free
- optic and electronic limit switch enclosed with the delivery by standard
- manual override inclusive
- elektric torque limit
- applications also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or gear-driven available

Special versions

- versions with actuator series STV-VR and STV-VS
- failsafe-type
- positioner-type
- ATEX type

Please contact us for technical information.

Pressure-temperature-diagram

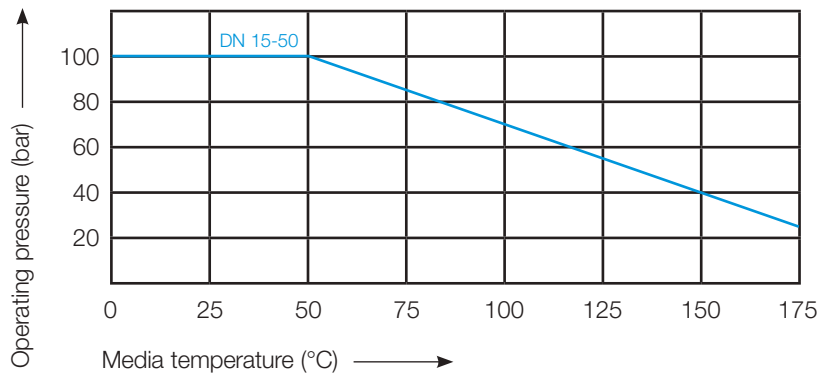
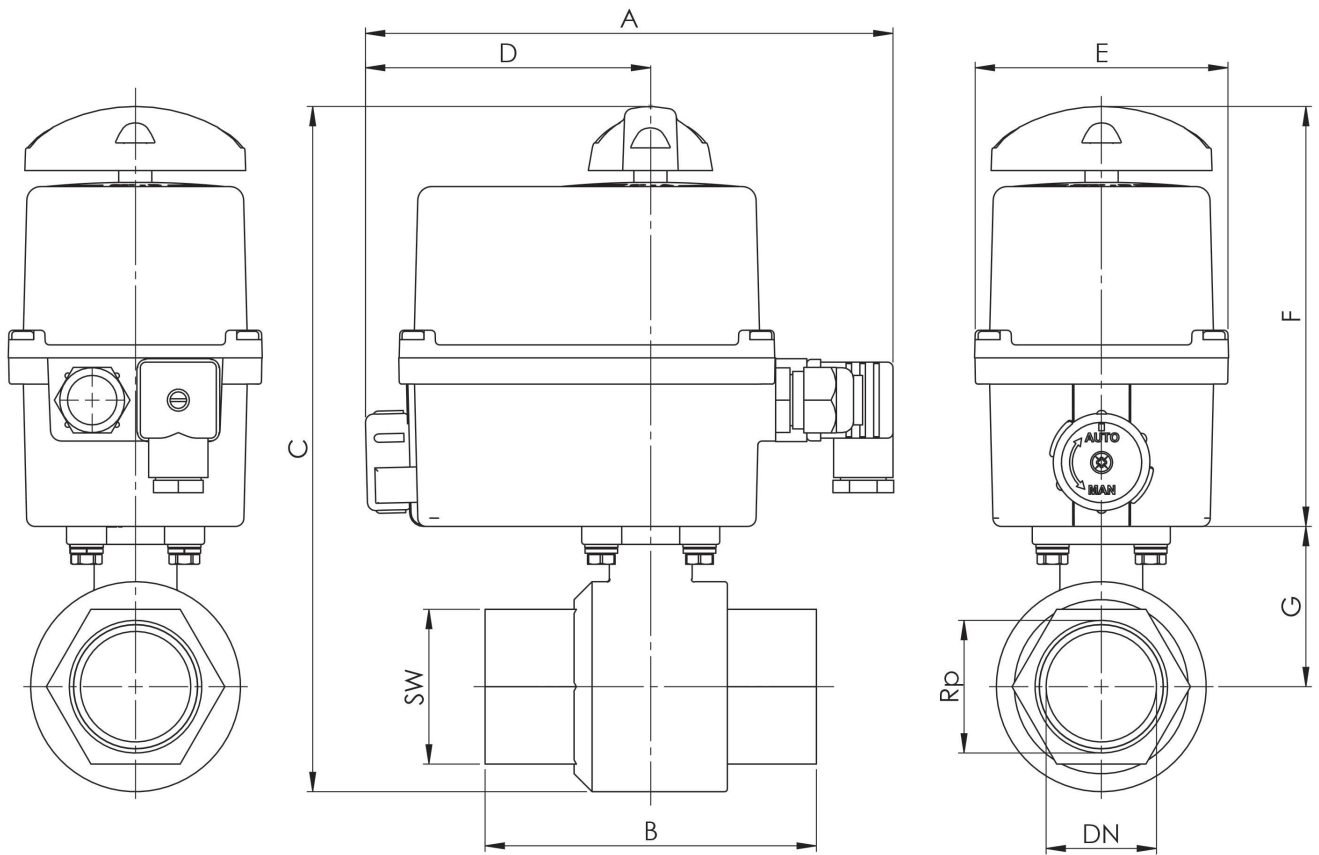


Table of dimensions

Rp	DN	Actuator size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	SW (mm)	Weight (kg)
1/2"	15	ER20	191	60	205	103	92	152	36	26	1,76
3/4"	20	ER20	191	70	213	103	92	152	39,5	32	1,90
1/0"	25	ER20	191	90	222	103	92	152	44	41	2,28
5/4"	32	ER35	191	110	235	103	92	152	51	50	2,76
3/2"	40	ER60	205	120	272	106	128	176	58	56	4,41
2/0"	50	ER60	205	140	292	106	128	176	68	69	6,07

Dimensions



Ordering code

EKNV-	1/0-	025-	ER20-X03-M00-240V AC/DC
	Connection size in inch	Nominal size	Actuator identification (M00 = ER Premier, G00 = ER Plus)

2/2-way electric valve – type EKO2V

Product description



Automatic valve in brass with floating precision ball. The valve is operated electrically and is characterised by long service life and high operational safety.

Technical data of 2/2-way ball valve

Technical data	
Nominal size	DN12 – DN80
Connection type	inside thread G 1/2" to G 3" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 12 – 25: PN 40 DN 32: PN 32 DN 40 – 65: PN 30 DN 80: PN 25
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical data	
Voltage	ER Premier 90-240V AC (90-350V DC) oder 24V AC/DC ER Plus 90-240V AC (90-350V DC) oder 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambient temperature	-10° C to + 55° C
Duty rating	30% ER Premier, 50% ER Plus
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- maintenance-free
- optic and electronil limit switch enclosed with the delivery by standard
- manual override inclusive
- elektrik torque limit
- applicatons also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or geardriven available

Special versions

- versions with actuator series STV-VR and STV-VS
- failsafe-type
- positioner-type
- ATEX type

Please contact us for technical information.

Pressure-temperature-diagram

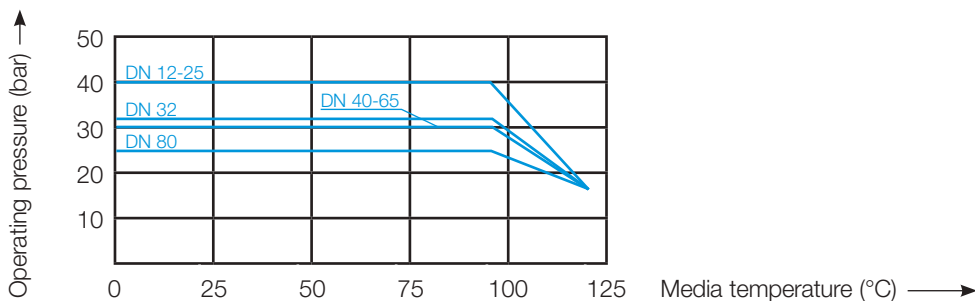
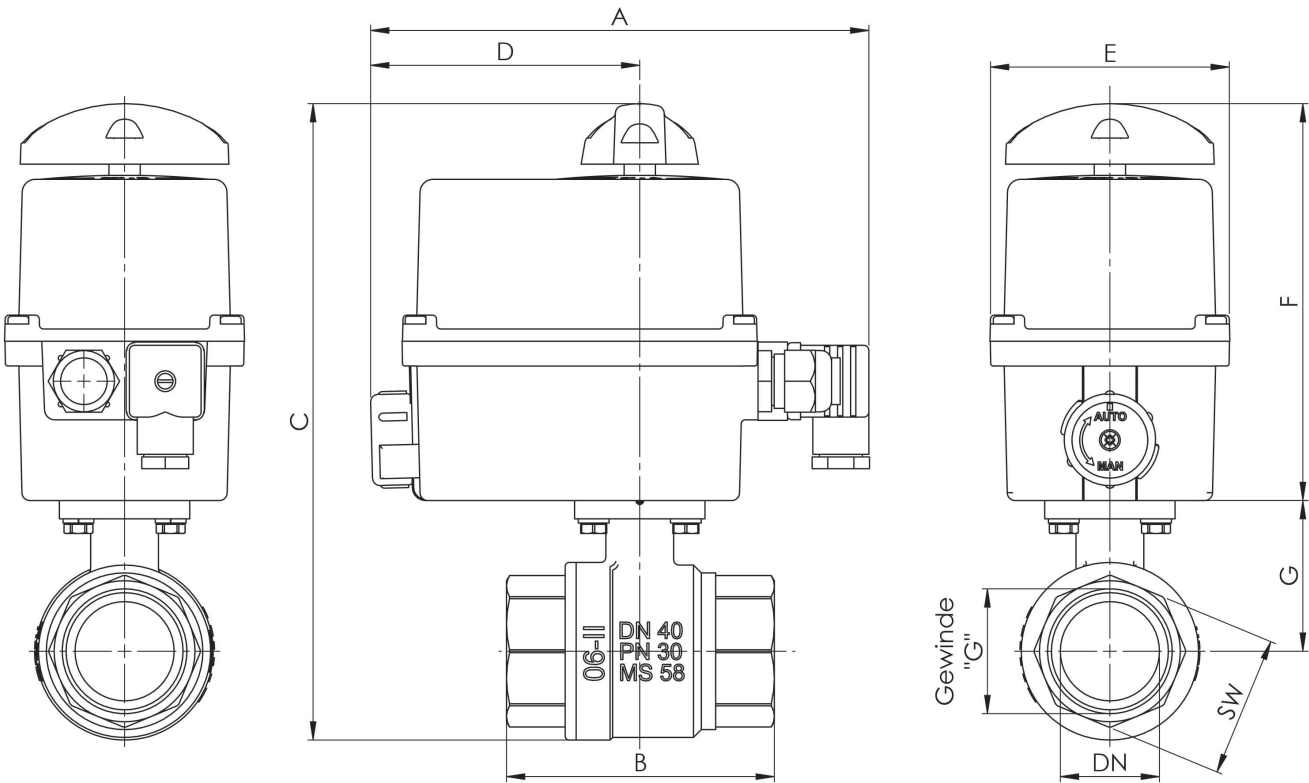


Table of dimensions

Rp	DN	Actuator size	A	B	C	D	E	F	G	SW	Weight (kg)
1/4"	12	ER10	191	64	197	103	92	152	29	26	1,78
3/8"	15	ER10	191	64	197	103	92	152	29	26	1,72
1/2"	15	ER10	191	64	197	103	92	152	29	26	1,72
3/4"	20	ER10	191	76	204	103	92	152	32,5	32	1,85
1/0"	25	ER10	191	88	212	103	92	152	37	40	2,15
5/4"	32	ER20	191	96	223	103	92	152	42	50	2,39
3/2"	40	ER35	191	103	244	103	92	152	58	54	2,60
2/0"	50	ER35	191	121	257	103	92	152	64	70	3,50
5/2"	65	ER35	205	165	321	106	128	176	90	85	6,32
3/0"	80	ER35	205	188	341	106	128	176	100	100	7,99

Dimensions



Ordering code

EKO2V-	1/0-	025-	ER20-X0A-M00-90-240V AC/DC
	Connection size in inch	Nominal size	Actuator identification (M00 = ER Premier, G00 = ER Plus)

3/2-way electric valve – type EKTV

Product description



3-way valve in stainless steel with floating precision ball. The valve is electrical operated and is characterised by long service life and high operational safety.

Technical data 3/2-way-ball valve

Technical data	
Nominal size	DN12 – DN38
Connection	female thread Rp 1/2" to Rp 2" acc. ISO 7-1 alternatively: weld-ends acc. EN 12627:1999
Mounting position	any orientation, not upside-down
Nominal pressure range	DN 12 – 20: PN 63 DN 25 – 38: PN 50
Operating pressure	see pressure-temperature-diagram
Temperature range	- 20° C to 180° C
Materials	casing: stainless steel AISI 316 (1.4408) ball, stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE+ FKM
Flow material	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical data	
Voltage	ER Premier 100-240V AC (100-350V DC) or 24V AC/DC ER Plus 100-240V AC (100-350V DC) or 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambient temperature	-10° C to +55° C
Duty rating	30% ER Premier, 50% ER Plus
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- 4-fold support of the ball in the shell-halves
- maintenance-free
- optic and electric limit switch enclosed with the delivery by standard
- manual override inclusive
- electric torque limit
- application also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or gear-driven available

Special versions

- versions with actuator series STV-VR and STV-VS
- failsafe-type
- positioner-type
- ATEX type

Please contact us for technical information.

Pressure-Temperature-Diagram

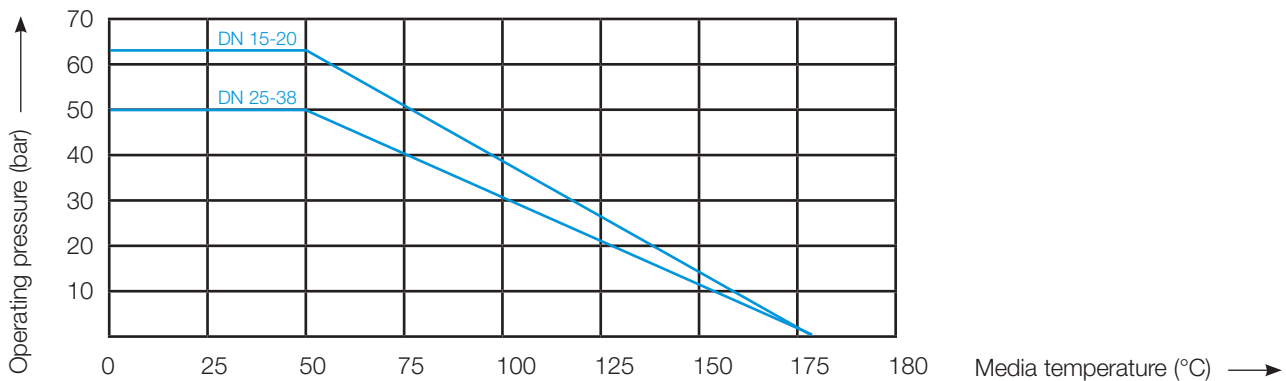
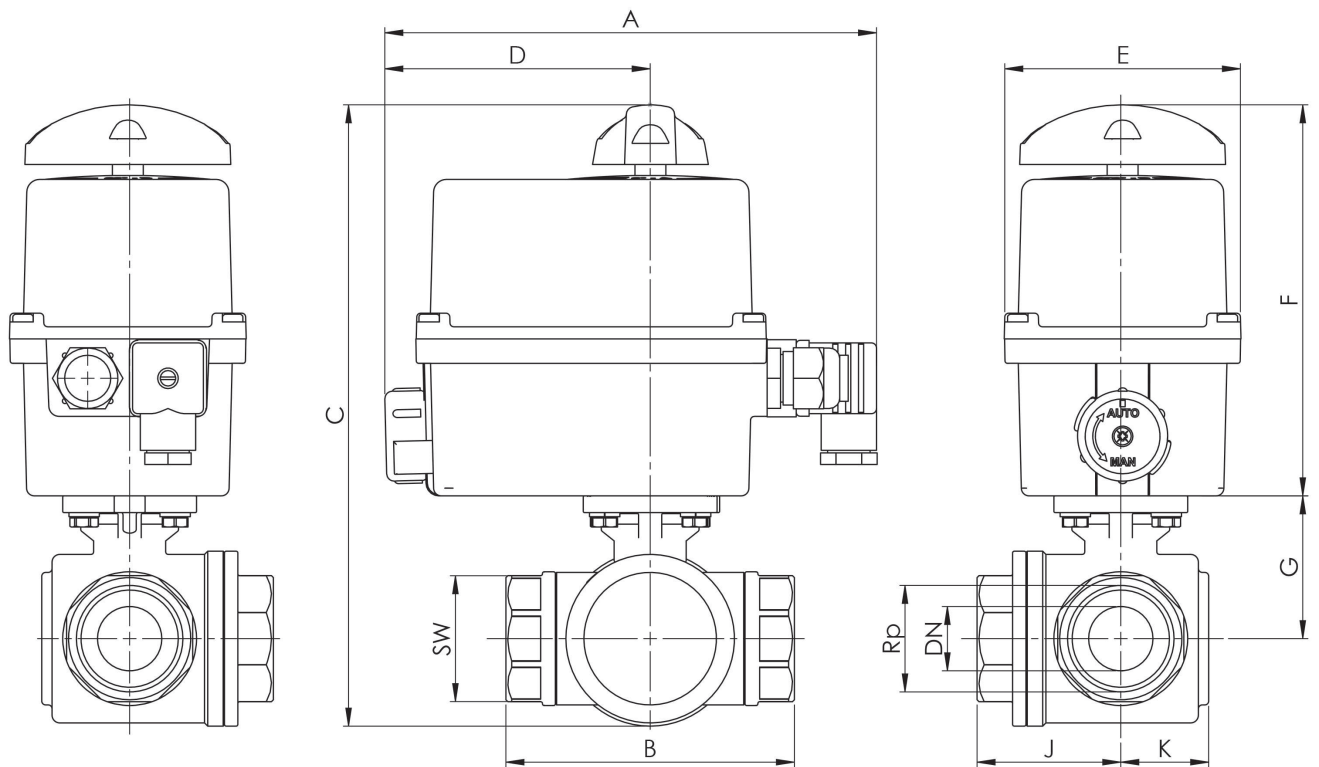


Table of dimensions

Rp	DN	Actuator size	A	B	C	D	E	F	G	J	K	SW	Weight (kg)
1/2"	12	ER20	191	72	211	103	92	152	38,5	36	20	28	2,08
3/4"	15	ER20	191	83	216	103	92	152	41	41,5	23	32,5	2,29
1/0"	20	ER35	191	99	229	103	92	152	49	49,5	28	41	2,90
5/4"	25	ER60	205	112	265	106	128	176	55	56	34,5	49,5	2,18
3/2"	32	ER100	205	125	278	106	128	176	63	62,5	37,5	56,5	5,75
2/0"	38	ER100	205	149	298	106	128	176	74	74,5	48	69,5	7,71

Dimensions



Ordering code

EKTV-	1/0-	T2-	020-	ER20-X0A-M00-90-240V AC/DC
	Connection size in inch	Switching position (acc. Table at the right)	Nominal size	Actuator identification (M00 = ER Premier, G00 = ER Plus)

Switching positions

ball hole		T				L
Position	0°					
	90°					
clockwise						
Switching positions		T1	T2	T3	T4	L4

2/2-way electric valve – type EKVV

Product description



Automatic valve in stainless steel with floating precision ball. The valve is electric operated and is characterised by long service life and high operational safety.

Technical data 2/2-way ball-valve

Technical data	
Nominal size	DN15 – DN100
Connection	between flanges acc. DIN EN 1092
Mounting position	any orientation, but not upside-down
Nominal pressure	DN 15 – 50, DN 80: PN 40 DN 65, DN 100: PN 16
Operating pressure	see pressure-temperature-diagram
Temperature range	- 20° C to 180° C
Materials	casing: stainless steel AISI 316 (1.4408) ball: stainless steel AISI 316 (1.4401) stem: stainless steel AISI 316 (1.4401) ball seal: PTFE stem seal: PTFE
Flow materials	neutral gases and fluids (other mediums upon request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical data	
Voltage	ER Premier 100-240V AC (100-350V DC) or 24V AC/DC ER Plus 100-240V AC (100-350V DC) or 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambiant temperature	-10° C to +55° C
Duty rating	30% ER Premier, 50% ER Plus
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- maintenance-free
- blow-out secure shaft
- optic and electronic limit switch enclosed with the delivery by standard
- manual override inclusive
- elektric torque limit
- applications also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or geardriven available

Special versions

- versions with actuator series STV-VR and STV-VS
- failsafe-type
- positioner-type
- ATEX type

Please contact us for technical information.

Pressure-temperature-diagram

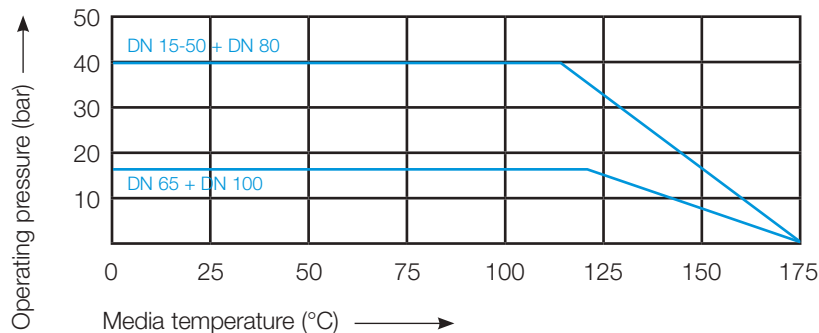
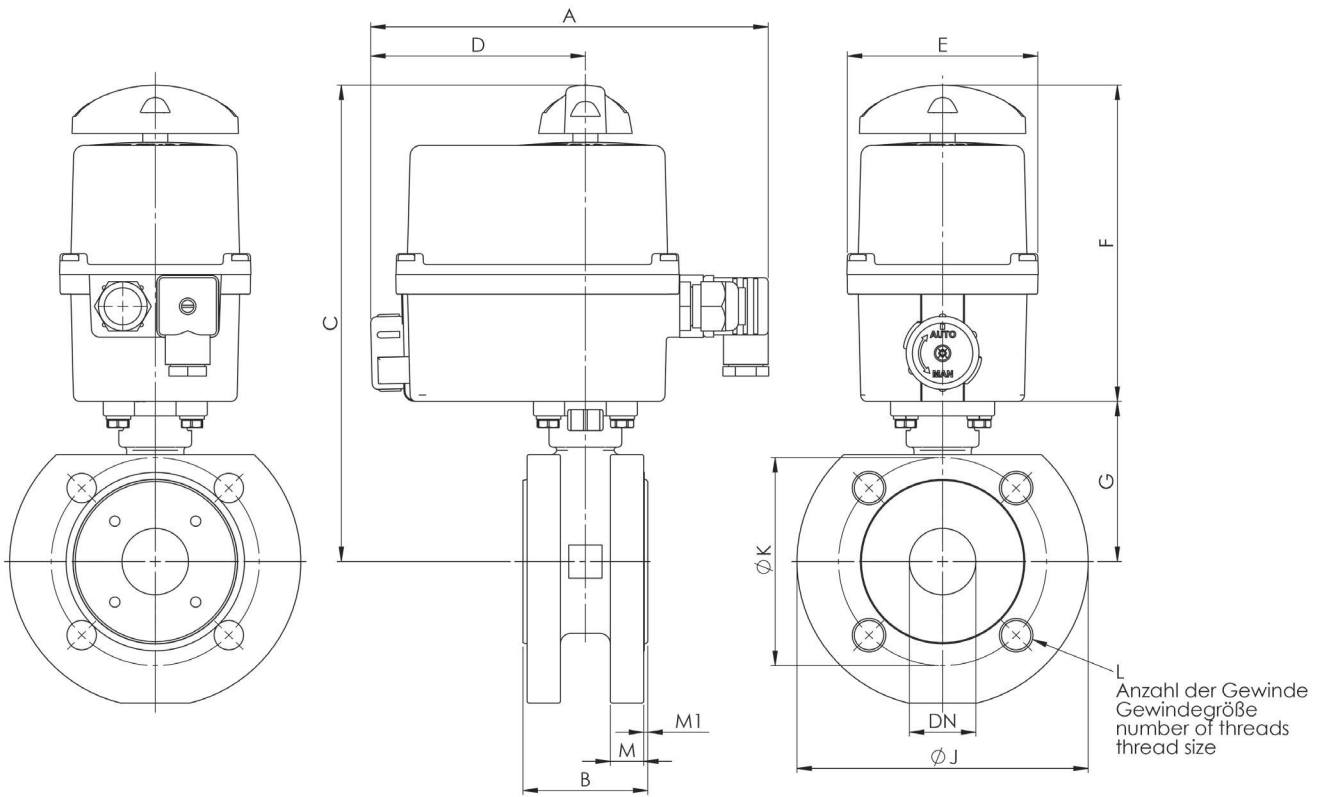


Table of dimensions

Rp	DN	Actuator size	A	B	C	D	E	F	G	øJ	øK	L	M/M1	Weight (kg)
1/2"	15	ER10	191	41	201	103	92	152	49	81	65	4 x M12	16 / 2	2,67
3/4"	20	ER20	191	44	206	103	92	152	54	99	75	4 x M12	18 / 2	3,37
1/0"	25	ER35	191	50	217	103	92	152	65	115	85	4 x M12	18 / 2	4,08
5/4"	32	ER35	191	60	229	103	92	152	77	140	100	4 x M16	18 / 2	5,56
3/2"	40	ER60	205	65	299	106	128	176	86	150	110	4 x M16	18 / 3	7,87
2/0"	50	ER60	205	80	269	106	128	176	93	165	125	4 x M16	20 / 3	9,00
5/2"	65	ER100	205	110	286	106	128	176	110	185	145	4 x M16	22 / 3	14,00
3/0"	80	ER100	205	120	296	106	128	176	120	200	160	8 x M16	24 / 3	16,86

Dimensions



Ordering code

EKWV-	1/0-	025-	ER20-X0A-M00-90-240V AC/DC
	Connection size in inch	Nominal size	Actuator identification (M00 = ER Premier, G00 = ER Plus)

3/2-way electric valve – type EMK2V

Product description



3-way-valve in brass with floating precision ball. The valve is electrically operated and characterised by long service life and high operational service.

Technical data of 3/2-way ball valve

Technical data	
Nominal size	DN10 – DN50
Connection type	inside thread G 3/8" to G 2" acc. to DIN EN ISO 228-1
Mounting position	any orientation
Nominal pressure rating	DN 10 – 20: PN 30, DN 25 – 32: PN 20, DN 40 – 50: PN 16
Operating pressure	see pressure-temperature diagram
Temperature range	-20 °C to 120 °C
Materials	casing: forging brass, chromium-plated ball: brass, hard chromium-plated switching shaft: brass, nickel-plated sealing bowl: PTFE switching shaft seal: PTFE + FKM
Flow media	neutral gases and liquids (other media on request)
Flow direction	any direction

Technical data actuator ER Premier/ER Plus

Technical data	
Voltage	ER Premier 100-240V AC (100-350V DC) or 24V AC/DC ER Plus 100-240V AC (100-350V DC) or 15-30V AC (12-48V DC)
Protection class	ER Premier IP65, ER Plus IP66
Ambiant temperature	-10° C to +55° C
Duty rating	30% ER Premier, 50% ER Plus
Elektric connection	1 cable screw ISO M20, 1 cable box 3P + T DIN43650
Interface	EN ISO 5211

Product features

- full bore
- 4-fold support of the ball in the shell-halves
- maintenance-free
- blow-out secure shaft
- optic and electronic limit switch enclosed with the delivery by standard
- manual override inclusive
- electric torque limit
- applications also in vacuum and high flow speeds
- alternatively also with pneumatic actuation, manual lever or gear-driven available

Special versions

- versions with actuator series STV-VR and STV-VS
- failsafe-type
- positioner-type
- ATEX type

Please contact us for technical information.

Pressure-temperature diagram

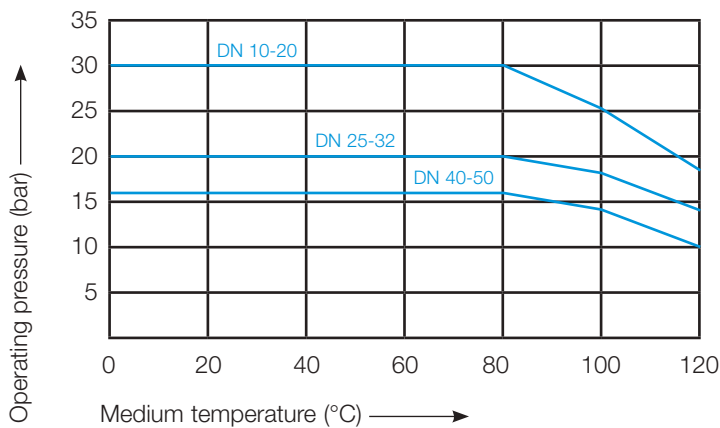
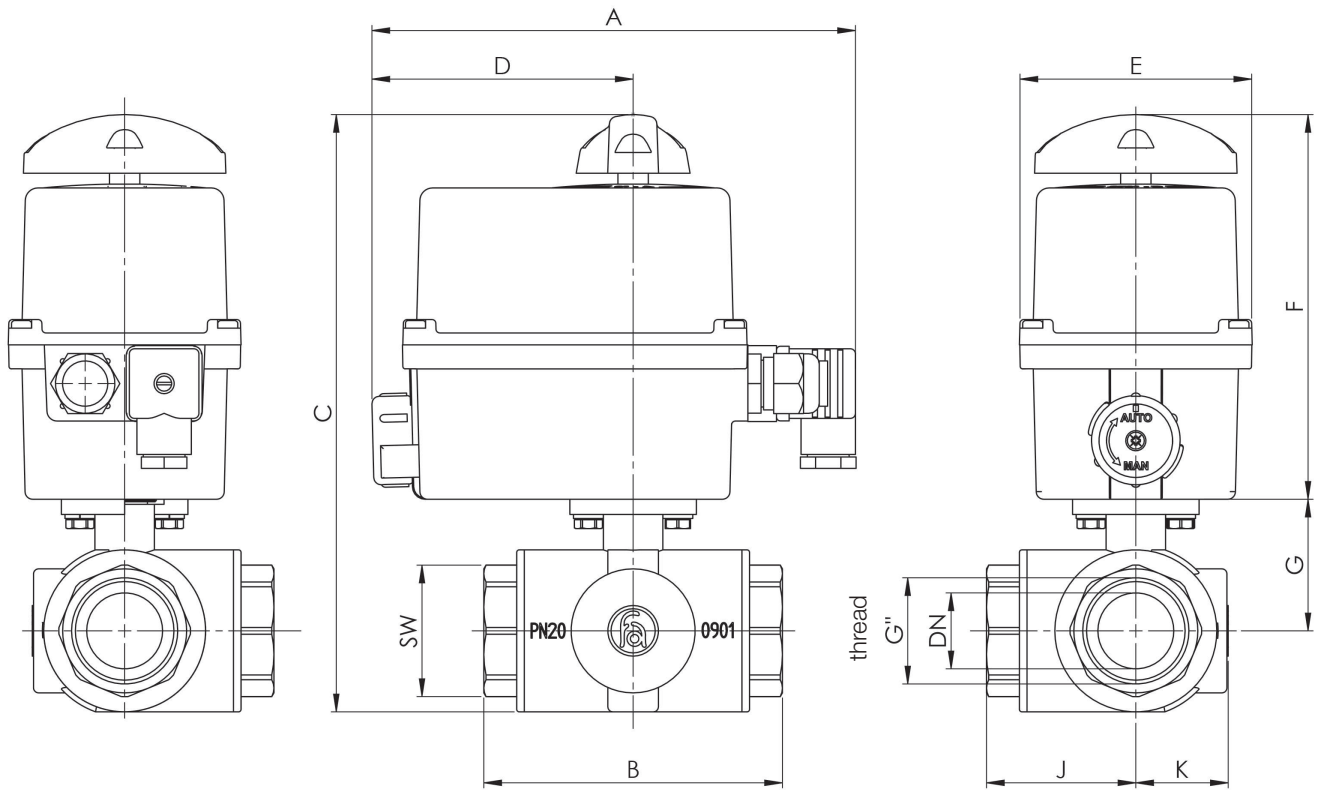


Table of dimensions

Rp	DN	Actuator size	A	B	C	D	E	F	G	J	K	SW	Weight (kg)
1/4"	10	ER10	191	65	197,5	103	92	152	30	32,5	18,5	22	1,86
3/8"	10	ER10	191	65	197,5	103	92	152	30	32,5	18,5	22	1,83
1/2"	15	ER10	191	78	203,5	103	92	152	33	39	22,5	27	2,01
3/4"	20	ER20	191	87	216,5	103	92	152	42	43,5	26,5	32	2,32
1/0"	25	ER20	191	105	227	103	92	152	47	52,5	32,5	40	2,91
5/4"	32	ER20	191	118	236	103	92	152	52	59	36,5	49	3,43
3/2"	40	ER35	205	134	286	106	128	176	70	67	43,5	54	6,11
2/0"	50	ER35	205	161	305	106	128	176	79,5	80,5	54,5	67	8,62

Dimensions



Switching positions

ball hole		T				L
Position ↻ clockwise	0°					
	90°					
switching positions		T1	T2	T3	T4	L4

Ordering code

EMKV-	1/0-	T2-	025-	ER20-X0A-M00-90-240V AC/DC
	Connection size in inch	Switching position (see diagram at the right)	Nominal size	Actuator identification (M00 = ER Premier; G00 = ER Plus)

Automatic butterfly valve – type EZDS

Product description



One-piece, blow-out safe, flow-fitting form, sealed-off and centric embedded butterfly valve. The automated butterfly valve is electrically actuated.

Technical data butterfly valve

Technical data	
Nominal size	DN25 bis DN600
Connection	flange connection as per EN 1092-1 & EN 1092-2, PN6/10/16/25/40, ASME/ANSI 125/150 BS10-d & BS10-e, JIS B2238 & JIS B2239 (more details on request)
Mounting position	any orientation
Nominal pressure	DN25: max. 10 bar DN32 – 350: max. 20 bar DN400 – 600: max. 10 bar
Installation length	nach EN 558-1, row 20 ISO 5752, row 20 API 609 diagram 2 (except DN400 – 600)
Temperature range	seat EDPM -15 °C to 120 °C
Material of butterfly-valve parts	casing: DN25 – cast iron GG25 casing: DN32 – 600 – ductile cast GGG40 disk: stainless steel 1.4408 shaft: stainless steel 1.4028 seat: see „temperature range“
Flow media	compare to the list of material resistance
Flow Direction	any direction

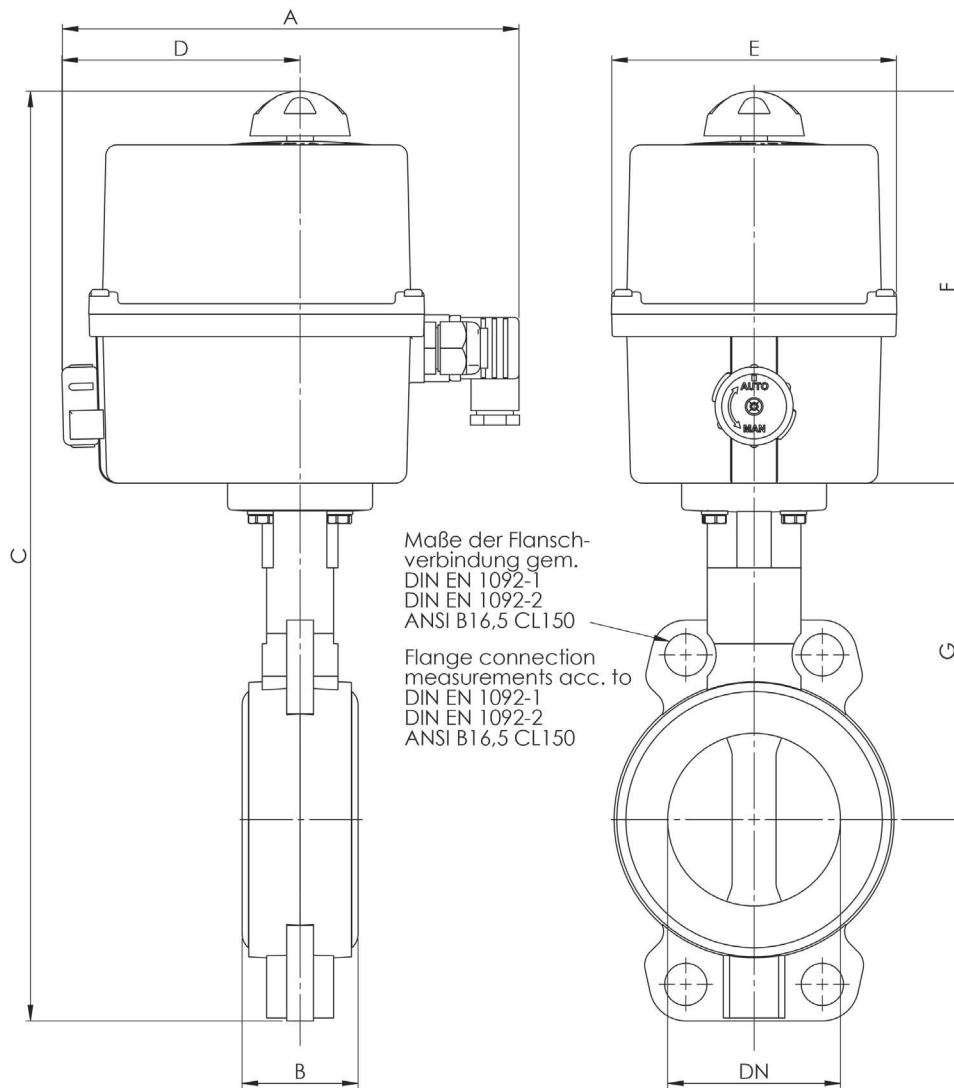
For technical data and product features please see the relevant datasheets of the electric actuators.

The dimensions of the automated valves differ related to the choice of the actuator. Please order a dimension sheet according to your individual specification.

Table of dimensions

DN	Actuator size	A	B	C	D	E	F	G	Weight (kg)
40	ER35	191	32	339	103	92	152	130	3,14
50	ER35	191	32	350	103	92	152	136	4,04
65	ER35	191	46	381	103	92	152	145	4,34
80	ER60	205	46	416	106	128	176	151	6,07
100	ER60	205	52	410	106	128	176	175	6,87
125	ER100	205	56	424	106	128	176	190	8,77

Dimensions



Chapter 3

Actuator lines

The pneumatic
quarter-turn actuators
actubar[®] and bar-agturn[®]

Elektric actuators
type STV



actubar[®]



bar-agturn[®]



**ER PLUS,
ER PREMIER,
VR, VS, VT,
VT PLUS, MT**

actubar[®]

The intelligent actuator



Type AD-001 + AD/AS-002



Type AD/AS-004 to -230



Type AD/AS-360 to -1200



Objective

actubar is the latest generation in our range of pneumatic actuators. Externally unmistakable and technically unique, the actubar offers new advantages and uses.

Technically speaking, actubar is the main component in the valve control system bar-vacontrol, a modular, intelligent system for monitoring and regulating automatic valves.

Working together with our directly-mountable system components bar-positurn2 or bar-posiswitch, actubar regulates quarter-turn valves economically and effectively.



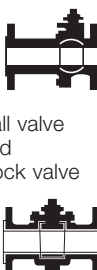



Benefits / Applications

- the unique construction of the actubar enables the addition of components acc. to VDI/VDE 3847 without hose connections or conduit.
- positioner and limit switch boxes with solenoid valves can be mounted directly, without conduit installation and constitute a compact unit in combination with actubar-actuators
- the standard interface (VDI / VDE 3845) allows mounting of all commercially available signal units
- end position can be adjusted at 0° and 90° from +5° to -10°
- reduced warehousing by using equal end-caps for single as well as double-acting actuators
- simple insertion and removal of safety springs
- flexible automation of valves through various ISO flange interfaces per actuator size
- optional coatings and materials enable usage even in aggressive environments
- long service life via plain-bearing system which reaches all moving parts
- octagonal pinion-connection enables actubar to fit universally onto valves with parallel or diagonally operating shafts
- blowout-secure pinion minimizes the danger of accidents
- wide spectrum of application through supply of different pivoting angle possibilities
- elevated failsafe performance by our SIL 3 certified actuators.

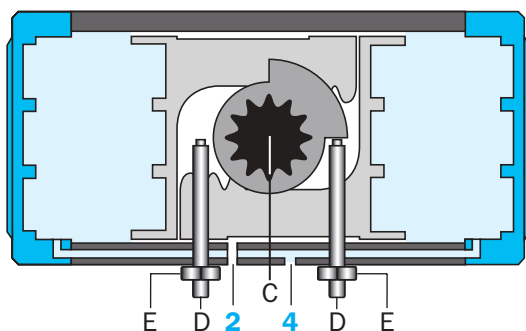
Technical data

	Standard model	Options available
Description	pneumatic double piston actuator type AD = double-acting type AS = single-acting (with spring return)	
Constructional features	rack and pinion principle with self-centering piston guides in the casing; single-acting: with bar safety springs	
Mounting position	any orientation	
Standards	interface actuator signal unit: acc. to VDI/VDE 3845 (NAMUR) and VDI/VDE 3847 interface actuator/control valve: acc. to NAMUR i.e. VDI/VDE 3845 interface actuator/valve: 4, i.e. 8 internal threaded in actuator casing acc. to EN ISO 5211	differing mounting and connecting dimensions possible pinion optional with internal double-D or acc. to DIN ISO 5211
Materials	casing: aluminium alloy, anodized caps: aluminium alloy pistons/racks: aluminium alloy pinion: corrosion-protected steel seals: NBR bearings: self-lubricating plastic screws: stainless steel A2	Casing: anodized, powder-coated, PTFE Caps: PTFE Pinion: stainless steel AISI 303; AISI 316 Seals: FKM
Ambient temperature	-20°C to +80°C	low-temperature model: -40° C to +80° C high-temperature model: 20° C to +160° C
Rated pivoting angle	double and single-acting: 90° rated pivoting angle as standard from +5° to -10° adjustable in both end positions	
Torque	2.5 Nm to 9,600 Nm	
Control pressure	2 to 8 bar	
Control medium / Quality	filtered air in respect of remaining oil content, dust and water minimum according to DIN ISO 8573-1:2010 [7: - :4]	also upon request: other non-aggressive gaseous or liquid mediums
Certificates	SIL 3 by TÜV Rheinland, test basis IEC61508 Parts 1-2 and 4-7:2010	

Mounting variations

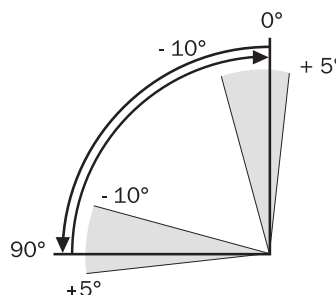
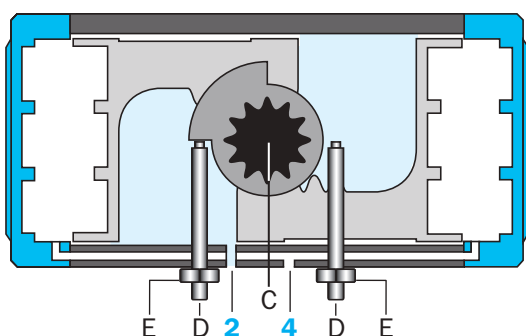
2/2-way-valve	Drive pinion	Function	Mounting type	2/2-way-valve	Drive pinion	Function	Mounting type
 Butterfly valve	 Double D = Z (upon request)	single-acting spring force closed	A	 Ball valve and Cock valve	 Double D = Z (upon request)	single-acting spring force closed	A
		single-acting spring force open	D			single-acting spring force open	D
	 Octagonal = V	single-acting spring force closed	F		 Octagonal = V	single-acting spring force closed	F
		single-acting spring force open	H			single-acting spring force open	H

Function – double-acting



When pressure is applied to both of the external chambers through input connection „4“, then the pistons move together into the basic position (0°). The force from both pistons is transferred onto the pinion „C“ via the toothed rack. If input connection „2“ is given pressure and „4“ as exhaust, then the pistons move apart into the 90° position.

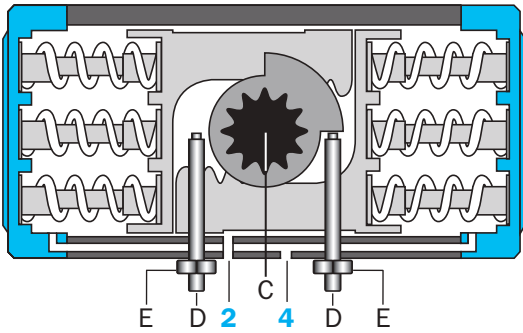
In both positions, the pivoting angle can be set via the adjusting screws „D“ to a position of + 5° and - 10° in a depressurised condition. When the correct angle is reached, then fix with locking nut „E“.



Torque for double-acting actuators, type AD [Nm]

Type	Control pressure P _{st} [bar]										
	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8
AD - 001	2,5	3,2	3,8	4,4	5,1	5,7	6,4	7,0	7,6	8,9	10,2
AD - 002	4	5,2	6,4	7,5	8,6	9,7	10,8	11,9	13	15,5	18
AD - 004	8	10	12	14	16	18	20	22	24	28	32
AD - 006	13	16	19	22	25	28	32	35	38	44	51
AD - 008	16	20	24	28	32	36	40	44	48	56	64
AD - 011	23	29	35	40	46	52	58	63	69	81	92
AD - 018	36	45	54	63	72	81	90	99	108	126	144
AD - 026	52	65	78	91	104	117	130	143	156	182	208
AD - 037	74	93	111	129	148	166	185	204	222	259	296
AD - 050	100	125	150	175	200	225	250	275	300	350	400
AD - 076	152	190	228	266	304	342	380	418	456	532	608
AD - 110	220	275	330	385	440	495	550	605	660	770	880
AD - 160	323	403	484	565	645	726	807	887	968	1129	1290
AD - 230	463	579	695	811	927	1043	1159	1274	1390	1622	1854
AD - 360	746	933	1119	1306	1492	1679	1865	2052	2238	2611	2984
AD - 520	1040	1300	1560	1820	2080	2340	2600	2860	3120	3640	4160
AD - 800	1560	1950	2340	2730	3120	3510	3900	4290	4680	5460	6240
AD - 1200	data in preparation										

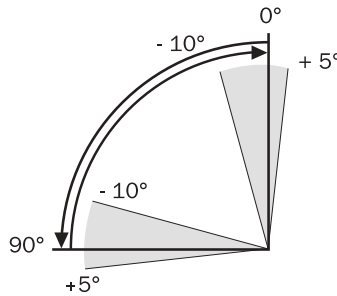
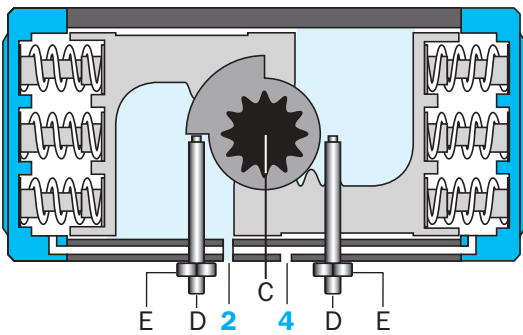
Function – single-acting



In the single-acting model the springs push the pistons back into the basic position and air is exhausted from connection „2“.

The number of springs can be selected to correspond to the applied pressure.

Adjustment of the end positions is described in „Function double-acting“.



Torques – single-acting actuators, type AS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at min. control pressure PSt [bar]																							
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
Type	No. springs	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
AS-002	2	1,0	1,6	2,4	3,1	3,6	4,3	4,8	5,5	6,0	6,7	7,1	7,8	8,2	8,9	9,4	10,0	10,5	11,1	11,6	12,2	13,9	14,5	16,2	16,8		
	4	2,1	3,3	0,8	2,1	2,0	3,3	3,1	4,5	4,3	5,7	5,4	6,8	6,5	7,9	7,5	9,0	8,7	10,1	9,8	11,2	12,2	13,6	14,7	16,0		
	6	3,2	5,1					1,0	3,2	2,3	4,5	3,5	5,7	4,7	6,9	5,8	8,0	7,0	9,2	8,2	10,4	10,6	12,8	12,9	15,1		
	8	4,4	6,9									1,7	4,6	3,0	5,8	4,2	7,0	5,4	8,1	6,5	9,2	8,9	11,5	11,4	13,9		
	10	5,4	8,6											1,2	4,8	2,4	6,0	3,6	7,1	4,7	8,2	7,0	10,5	9,4	12,7		
AS-004	2	1	3	5	7	7	9	9	11	11	12	13	14	15	16	17	18	19	20	21	22	25	26	29	30		
	4	3	5	3	5	5	7	7	9	9	11	10	13	12	15	14	17	16	19	18	21	22	25	26	29		
	6	4	8			2	6	4	8	6	10	8	12	10	14	12	16	14	18	16	20	20	24	24	28		
	8	5	11					1	7	3	9	5	10	7	12	9	14	11	16	13	18	17	22	21	26		
	10	7	13							1	7	3	9	4	11	6	13	8	15	10	17	14	21	18	25		
AS-006	2	2	4	8	11	12	14	15	17	18	20	21	23	24	26	27	30	31	33	34	36	40	42	46	48		
	4	4	8	4	8	7	12	11	15	14	18	17	21	20	24	23	27	26	31	30	34	36	40	42	46		
	6	6	13			3	10	6	13	10	16	13	19	16	22	19	25	22	28	25	32	32	38	38	44		
	8	8	17					2	11	5	14	8	17	12	20	15	23	18	26	21	30	27	36	34	42		
	10	11	21							1	12	4	15	7	18	11	21	14	24	17	27	23	34	30	40		
AS-008	2	2	4	8	11	12	14	15	17	18	20	21	23	24	26	27	30	31	33	34	36	40	42	46	48		
	4	4	8	4	8	7	12	11	15	14	18	17	21	20	24	23	27	26	31	30	34	36	40	42	46		
	5	8	14	2	9	6	13	10	17	14	21	18	25	22	29	26	33	30	37	34	41	42	49	50	57		
	6	9	17			3	11	7	15	11	19	15	23	19	27	23	31	27	35	31	39	39	47	47	55		
	7	11	20					4	14	8	18	12	22	16	26	20	30	24	34	28	38	36	46	44	54		
	8	12	22					2	12	6	16	10	20	14	24	18	28	22	32	26	36	34	44	42	52		
	9	14	25							3	15	7	19	11	23	15	27	19	31	23	35	31	43	39	51		
	10	15	28									4	17	8	21	12	25	16	29	20	33	28	41	36	49		
	11	17	31									1	16	5	20	9	24	13	28	17	32	25	40	33	48		
	12	18	34											2	18	6	22	10	26	14	30	22	38	30	46		
	13	20	36													4	21	8	25	12	29	20	37	28	45		
	14	21	39													1	19	5	23	9	27	17	35	25	43		

Torques – single-acting actuators, type AS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at min. control pressure PSt [bar]																							
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
Type	No. springs	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
AS-011	3	6	12	11	17	17	23	23	29	28	34	34	40	40	46	46	52	51	57	57	63	69	75	80	86		
	4	8	16	7	15	13	21	19	27	24	32	30	38	36	44	42	50	47	55	53	61	65	73	76	84		
	5	10	20	3	13	9	19	15	25	20	30	26	36	32	42	38	48	43	53	49	59	61	71	72	82		
	6	12	24			5	17	11	23	16	28	22	34	28	40	34	46	39	51	45	57	57	69	68	80		
	7	14	28			1	15	7	21	12	26	18	32	24	38	30	44	35	49	41	55	53	67	64	78		
	8	16	31					4	19	9	24	15	30	21	36	27	42	32	47	38	53	50	65	61	76		
	9	18	35							5	22	11	28	17	34	23	40	28	45	34	51	46	63	57	74		
	10	20	39							1	20	7	26	13	32	19	38	24	43	30	49	42	61	53	72		
	11	22	43									3	24	9	30	15	36	20	41	26	47	38	59	49	70		
	12	24	47											5	28	11	34	16	39	22	45	34	57	45	68		
	13	26	51											1	26	7	32	12	37	18	43	30	55	41	66		
	14	28	55													3	30	8	35	14	41	26	53	37	64		
	AS-018	3	9	18	18	27	27	36	36	45	45	54	54	63	63	72	72	81	81	90	90	99	108	117	126	135	
		4	12	24	12	24	21	33	30	42	39	51	48	60	57	69	66	78	75	87	84	96	102	114	120	132	
5		15	30	6	21	15	30	24	39	33	48	42	57	51	66	60	75	69	84	78	93	96	111	114	129		
6		18	36			9	27	18	36	27	45	36	54	45	63	54	72	63	81	72	90	90	108	108	126		
7		21	42			3	24	12	33	21	42	30	51	39	60	48	69	57	78	66	87	84	105	102	123		
8		24	48					6	30	15	39	24	48	33	57	42	66	51	75	60	84	78	102	96	120		
9		27	54							9	36	18	45	27	54	36	63	45	72	54	81	72	99	90	117		
10		30	60							3	33	12	42	21	51	30	60	39	69	48	78	66	96	84	114		
11		33	66									6	39	15	48	24	57	33	66	42	75	60	93	78	111		
12		36	72											9	45	18	54	27	63	36	72	54	90	72	108		
13		39	78												3	42	12	51	21	60	30	69	48	87	66	105	
14		42	84													6	48	15	57	24	66	42	84	60	102		
AS-026		3	13	27	25	39	38	52	51	65	64	78	77	91	90	104	103	117	116	130	129	143	155	169	181	195	
		4	17	35	17	35	30	48	43	61	56	74	69	87	82	100	95	113	108	126	121	139	147	165	173	191	
	5	21	44	8	31	21	44	34	57	47	70	60	83	73	96	86	109	99	122	112	135	138	161	164	187		
	6	26	53			12	40	25	53	38	66	51	79	64	92	77	105	90	118	103	131	129	157	155	183		
	7	30	62			3	35	16	48	29	61	42	74	55	87	68	100	81	113	94	126	120	152	146	178		
	8	34	71					7	44	20	57	33	70	46	83	59	96	72	109	85	122	111	148	137	174		
	9	38	80							11	53	24	66	37	79	50	92	63	105	76	118	102	144	128	170		
	10	43	89							2	49	15	62	28	75	41	88	54	101	67	114	93	140	119	166		
	11	47	98									6	57	19	70	32	83	45	96	58	109	84	135	110	161		
	12	51	106											11	66	24	79	37	92	50	105	76	131	102	157		
	13	55	115												2	62	15	75	28	88	41	101	67	127	93	153	
	14	60	124													6	71	19	84	32	97	58	123	84	149		
	AS-037	3	21	40	34	53	53	72	71	90	89	108	108	127	126	145	145	164	163	182	182	201	219	238	256	275	
		4	27	53	21	47	40	66	58	84	76	102	95	121	113	139	132	158	150	176	169	195	206	232	243	269	
5		34	66	8	40	27	59	45	77	63	95	82	114	100	132	119	151	137	169	156	188	193	225	230	262		
6		41	80			13	52	31	70	49	88	68	107	86	125	105	144	123	162	142	181	179	218	216	255		
7		48	93					18	63	36	81	55	100	73	118	92	137	110	155	129	174	166	211	203	248		
8		55	106					5	56	23	74	42	93	60	111	79	130	97	148	116	167	153	204	190	241		
9		62	119							10	67	29	86	47	104	66	123	84	141	103	160	140	197	177	234		
10		69	133									15	79	33	97	52	116	70	134	89	153	126	190	163	227		
11		75	146									2	73	20	91	39	110	57	128	76	147	113	184	150	221		
12		82	159											7	84	26	103	44	121	63	140	100	177	137	214		
13		89	173													12	96	30	114	49	133	86	170	123	207		
14		96	186																	17	107	36	126	73	163	110	200

Torques – single-acting actuators, type AS [Nm]

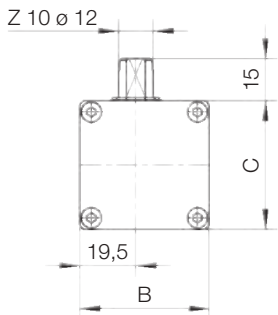
Spring force				Pneumatic applied torque Md N [Nm] at min. control pressure Pst [bar]																							
Type	No. springs	Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
AS-050	3	28	53	47	72	72	97	97	122	122	147	147	172	172	197	197	222	222	247	247	272	297	322	347	372		
	4	37	71	29	63	54	88	79	113	104	138	129	163	154	188	179	213	204	238	229	263	279	313	329	363		
	5	46	88	12	54	37	79	62	104	87	129	112	154	137	179	162	204	187	229	212	254	262	304	312	354		
	6	56	106			19	69	44	94	69	119	94	144	119	169	144	194	169	219	194	244	244	294	294	344		
	7	65	124					26	85	51	110	76	135	101	160	126	185	151	210	176	235	226	285	276	335		
	8	74	142					8	76	33	101	58	126	83	151	108	176	133	201	158	226	208	276	258	326		
	9	83	159							16	92	41	117	66	142	91	167	116	192	141	217	191	267	241	317		
	10	93	177									23	107	48	132	73	157	98	182	123	207	173	257	223	307		
	11	102	195									5	98	30	123	55	148	80	173	105	198	155	248	205	298		
	12	111	212											13	114	38	139	63	164	88	189	138	239	188	289		
	13	121	230													20	129	45	154	70	179	120	229	170	279		
	14	130	248															27	145	52	170	102	220	152	270		
	AS-076	3	42	80	72	110	110	148	148	186	186	224	224	262	262	300	300	338	338	376	376	414	452	490	528	566	
		4	56	107	45	96	83	134	121	172	159	210	197	248	235	286	273	324	311	362	349	400	425	476	501	552	
5		70	134	18	82	56	120	94	158	132	196	170	234	208	272	246	310	284	348	322	386	398	462	474	538		
6		84	161			29	106	67	144	105	182	143	220	181	258	219	296	257	334	295	372	371	448	447	524		
7		98	188			2	92	40	130	78	168	116	206	154	244	192	282	230	320	268	358	344	434	420	510		
8		112	214					14	116	52	154	90	192	128	230	166	268	204	306	242	344	318	420	394	496		
9		126	241							25	140	63	178	101	216	139	254	177	292	215	330	291	406	367	482		
10		140	268									36	164	74	202	112	240	150	278	188	316	264	392	340	468		
11		154	295									9	150	47	188	85	226	123	264	161	302	237	378	313	454		
12		168	321											21	174	59	212	97	250	135	288	211	364	287	440		
13		183	348													32	197	70	235	108	273	184	349	260	425		
14		197	375													5	183	43	221	81	259	157	335	233	411		
AS-110		3	66	116	104	154	159	209	214	264	269	319	324	374	379	429	434	484	489	539	544	594	654	704	764	814	
		4	88	155	65	132	120	187	175	242	230	297	285	352	340	407	395	462	450	517	505	572	615	682	725	792	
	5	110	193	27	110	82	165	137	220	192	275	247	330	302	385	357	440	412	495	467	550	577	660	687	770		
	6	132	232			43	143	98	198	153	253	208	308	263	363	318	418	373	473	428	528	538	638	648	748		
	7	154	271			4	121	59	176	114	231	169	286	224	341	279	396	334	451	389	506	499	616	609	726		
	8	176	309					21	154	76	209	131	264	186	319	241	374	296	429	351	484	461	594	571	704		
	9	197	348							37	188	92	243	147	298	202	353	257	408	312	463	422	573	532	683		
	10	219	387									53	221	108	276	163	331	218	386	273	441	383	551	493	661		
	11	241	425									15	199	70	254	125	309	180	364	235	419	345	529	455	639		
	12	263	464											31	232	86	287	141	342	196	397	306	507	416	617		
	13	285	503													47	265	102	320	157	375	267	485	377	595		
	14	307	541													9	243	64	298	119	353	229	463	339	573		
	AS-160	3	84	160	162	239	243	319	323	400	404	481	485	561	565	642	646	723	727	803	807	884	969	1045	1130	1207	
		4	112	214	109	211	189	292	270	372	351	453	431	534	512	614	593	695	673	775	754	856	915	1017	1076	1179	
5		140	267	55	183	136	264	216	344	297	425	378	506	458	586	539	667	620	748	700	828	862	989	1023	1151		
6		168	321			82	236	163	316	244	397	324	478	405	558	486	639	566	720	647	800	808	962	969	1123		
7		195	374					109	288	190	369	271	450	351	530	432	611	513	692	593	772	755	934	916	1095		
8		223	428					56	261	137	341	217	422	298	502	379	583	459	664	540	744	701	906	862	1067		
9		251	481							83	313	164	394	244	475	325	555	406	636	486	717	648	878	809	1039		
10		279	535									110	366	191	447	272	527	352	608	433	689	594	850	756	1011		
11		307	588											137	419	218	499	299	580	379	661	541	822	702	983		
12		335	642													165	471	245	552	326	633	487	794	649	955		
13		363	695															192	524	272	605	434	766	595	927		
14		391	749																	219	577	380	738	542	900		

Spring force			Pneumatic applied torque Md N [Nm] at min. control pressure PSt [bar]																							
Md F [Nm]			2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
Type	No. springs	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
AS-230	3	128	221	242	335	358	451	474	567	590	683	706	799	822	915	938	1030	1053	1146	1169	1262	1401	1494	1633	1725	
	4	171	295	169	293	285	408	400	524	516	640	632	756	748	872	864	988	980	1103	1096	1219	1327	1451	1559	1683	
	5	214	368	95	250	211	366	327	482	443	597	559	713	674	829	790	945	906	1061	1022	1177	1254	1408	1485	1640	
	6	256	442	21	207	137	323	253	439	369	555	485	671	601	786	717	902	832	1018	948	1134	1180	1366	1412	1597	
	7	299	516			64	280	180	396	295	512	411	628	527	744	643	860	759	975	875	1091	1106	1323	1338	1555	
	8	342	589					106	353	222	469	338	585	453	701	569	817	685	933	801	1048	1033	1280	1264	1512	
	9	384	663					32	311	148	427	264	542	380	658	496	774	611	890	727	1006	959	1237	1191	1469	
	10	427	737							74	384	190	500	306	616	422	731	538	847	654	963	885	1195	1117	1426	
	11	470	810									117	457	232	573	348	689	464	804	580	920	812	1152	1043	1384	
	12	513	884											159	530	275	646	390	762	506	878	738	1109	970	1341	
	13	555	958													201	603	317	719	433	835	664	1067	896	1298	
	14	598	1031															243	676	359	792	591	1024	822	1256	
	AS-360	1	74	112,5	633,5	672	820	858,5	1006,5	1045	1193	1231,5	1379,5	1418	1566	1604,5	1752,5	1791	1939	1977,5	2125,5	2164	2498,5	2537	2871,5	2910
		2	148	225	521	598	707,5	784,5	894	971	1080,5	1157,5	1267	1344	1453,5	1530,5	1640	1717	1826,5	1903,5	2013	2090	2386	2463	2759	2836
3		222	337,5	408,5	524	595	710,5	781,5	897	968	1083,5	1154,5	1270	1341	1456,5	1527,5	1643	1714	1829,5	1900,5	2016	2273,5	2389	2646,5	2762	
4		296	450	296	450	482,5	636,5	669	823	855,5	1009,5	1042	1196	1228,5	1382,5	1415	1569	1601,5	1755,5	1788	1942	2161	2315	2534	2688	
5		370	562,5	183,5	376	370	562,5	556,5	749	743	935,5	929,5	1122	1116	1308,5	1302,5	1495	1489	1681,5	1675,5	1868	2048,5	2241	2421,5	2614	
6		444	675	71	302	257,5	488,5	444	675	630,5	861,5	817	1048	1003,5	1234,5	1190	1421	1376,5	1607,5	1563	1794	1936	2167	2309	2540	
7		518	787,5			145	414,5	331,5	601	518	787,5	704,5	974	891	1160,5	1077,5	1347	1264	1533,5	1450,5	1720	1823,5	2093	2196,5	2466	
8		592	900			32,5	340,5	219	527	405,5	713,5	592	900	778,5	1086,5	965	1273	1151,5	1459,5	1338	1646	1711	2019	2084	2392	
9		666	1012,5					106,5	453	293	639,5	479,5	826	666	1012,5	852,5	1199	1039	1385,5	1225,5	1572	1598,5	1945	1971,5	2318	
10		740	1125							180,5	565,5	367	752	553,5	938,5	740	1125	926,5	1311,5	1113	1498	1486	1871	1859	2244	
11		814	1237,5							68	491,5	254,5	678	441	864,5	627,5	1051	814	1237,5	1000,5	1424	1373,5	1797	1746,5	2170	
12		888	1350											142	604	328,5	790,5	515	977	701,5	1163,5	888	1350	1261	1723	1634
AS-520	1	98	162	878	942	1138	1202	1398	1462	1658	1722	1918	1982	2178	2242	2438	2502	2698	2762	2958	3022	3478	3542	3998	4062	
	2	196	324	716	844	976	1104	1236	1364	1496	1624	1756	1884	2016	2144	2276	2404	2536	2664	2796	2924	3316	3444	3836	3964	
	3	294	486	554	746	814	1006	1074	1266	1334	1526	1594	1786	1854	2046	2114	2306	2374	2566	2634	2826	3154	3346	3674	3866	
	4	392	648	392	648	652	908	912	1168	1172	1428	1432	1688	1692	1948	1952	2208	2212	2468	2472	2728	2992	3248	3512	3768	
	5	490	810	230	550	490	810	750	1070	1010	1330	1270	1590	1530	1850	1790	2110	2050	2370	2310	2630	2830	3150	3350	3670	
	6	588	972	68	452	328	712	588	972	848	1232	1108	1492	1368	1752	1628	2012	1888	2272	2148	2532	2668	3052	3188	3572	
	7	686	1134			166	614	426	874	686	1134	946	1394	1206	1654	1466	1914	1726	2174	1986	2434	2506	2954	3026	3474	
	8	784	1296			4	516	264	776	524	1036	784	1296	1044	1556	1304	1816	1564	2076	1824	2336	2344	2856	2864	3376	
	9	882	1458					102	678	362	938	622	1198	882	1458	1142	1718	1402	1978	1662	2238	2182	2758	2702	3278	
	10	980	1620							200	840	460	1100	720	1360	980	1620	1240	1880	1500	2140	2020	2660	2540	3180	
	11	1078	1782							38	742	298	1002	558	1262	818	1522	1078	1782	1338	2042	1858	2562	2378	3082	
	12	1176	1944											136	904	396	1164	656	1424	916	1684	1176	1944	1696	2464	2216
AS-800	1	108	185	1375	1452	1765	1842	2155	2232	2545	2622	2935	3012	3325	3402	3715	3792	4105	4182	4495	4572	5275	5352	6055	6132	
	2	216	370	1190	1344	1580	1734	1970	2124	2360	2514	2750	2904	3140	3294	3530	3684	3920	4074	4310	4464	5090	5244	5870	6024	
	3	324	555	1005	1236	1395	1626	1785	2016	2175	2406	2565	2796	2955	3186	3345	3576	3735	3966	4125	4356	4905	5136	5685	5916	
	4	432	740	820	1128	1210	1518	1600	1908	1990	2298	2380	2688	2770	3078	3160	3468	3550	3858	3940	4248	4720	5028	5500	5808	
	5	540	925	635	1020	1025	1410	1415	1800	1805	2190	2195	2580	2585	2970	2975	3360	3365	3750	3755	4140	4535	4920	5315	5700	
	6	648	1110	450	912	840	1302	1230	1692	1620	2082	2010	2472	2400	2862	2790	3252	3180	3642	3570	4032	4350	4812	5130	5592	
	7	756	1295	265	804	655	1194	1045	1584	1435	1974	1825	2364	2215	2754	2605	3144	2995	3534	3385	3924	4165	4704	4945	5484	
	8	864	1480	80	696	470	1086	860	1476	1250	1866	1640	2256	2030	2646	2420	3036	2810	3426	3200	3816	3980	4596	4760	5376	
	9	972	1665			285	978	675	1368	1065	1758	1455	2148	1845	2538	2235	2928	2625	3318	3015	3708	3795	4488	4575	5268	
	10	1080	1850			100	870	490	1260	880	1650	1270	2040	1660	2430	2050	2820	2440	3210	2830	3600	3610	4380	4390	5160	
	11	1188	2035					305	1152	695	1542	1085	1932	1475	2322	1865	2712	2255	3102	2645	3492	3425	4272	4205	5052	
	12	1296	2220					120	1044	510	1434	900	1824	1290	2214	1680	2604	2070	2994	2460	3384	3240	4164	4020	4944	
	13	1404	2405							325	1326	715	1716	1105	2106	1495	2496	1885	2886	2275	3276	3055	4056	3835	4836	
	14	1512	2590							140	1218	530	1608	920	1998	1310	2388	1700	2778	2090	3168	2870	3948	3650	4728	
	15	1620	2775									345	1500	735	1890	1125	2280	1515	2670	1905	3060	2685	3840	3465	4620	
	16	1728	2960									160	1392	550	1782	940	2172	1330	2562	1720	2952	2500	3732	3280	4512	

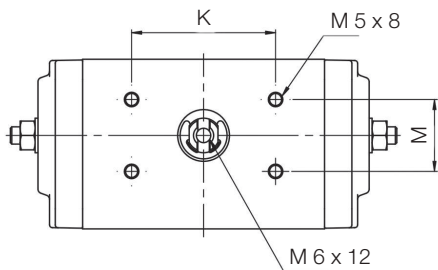
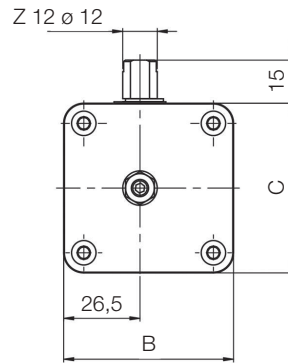
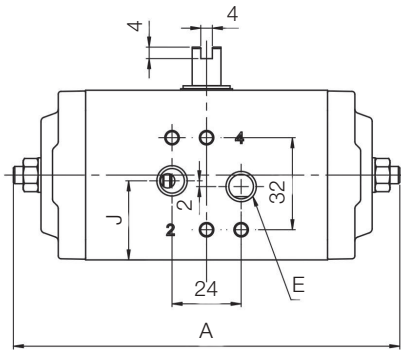
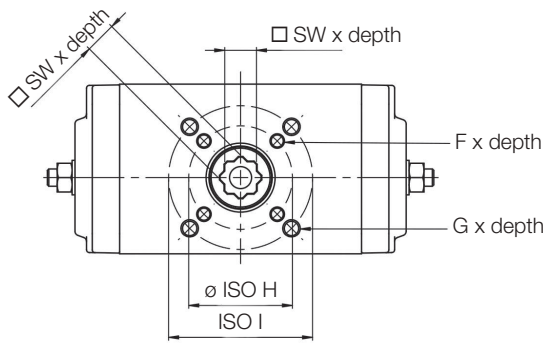
AS-1200

data in preparation

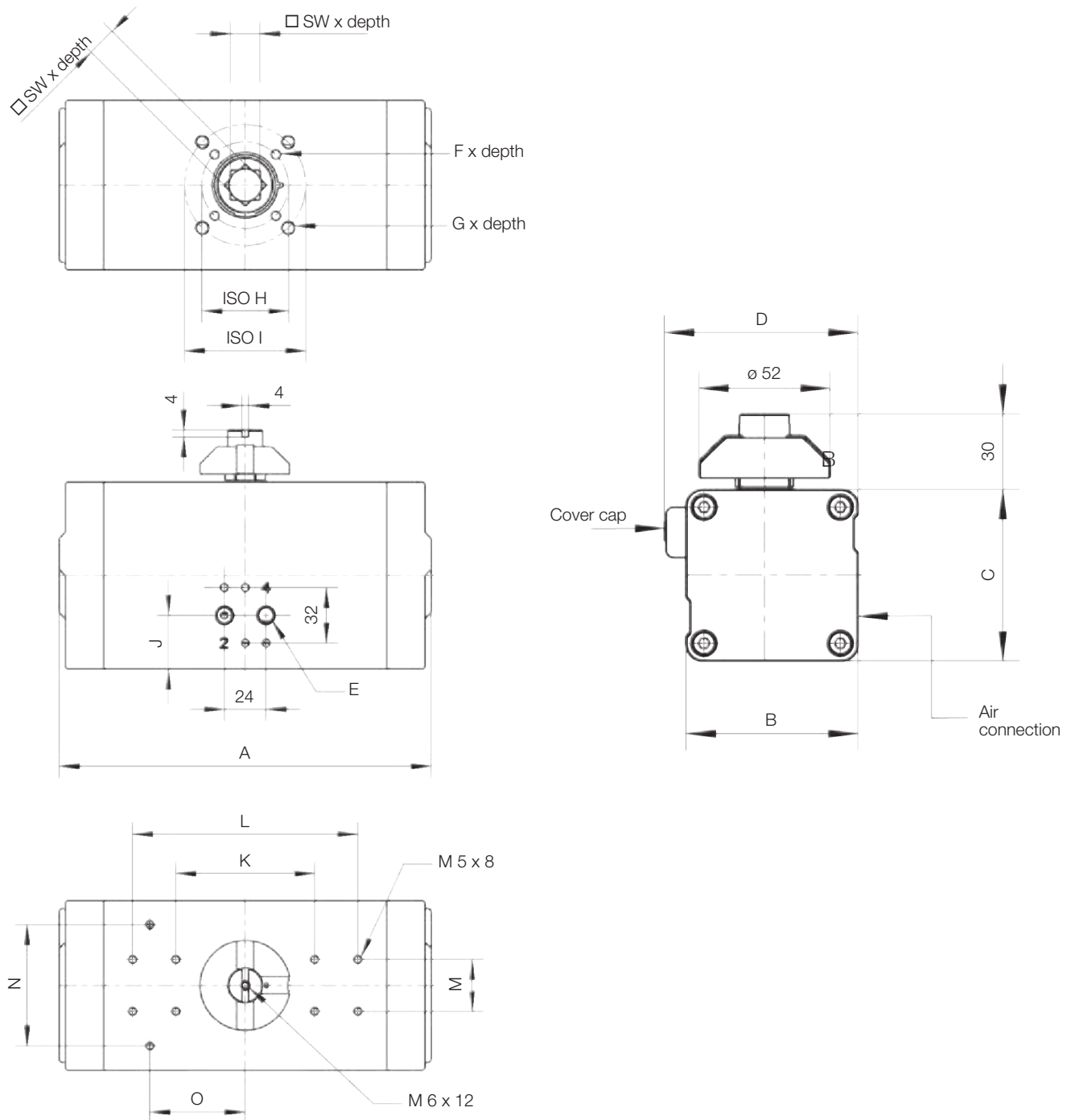
Dimensioned drawings for actubar type AD-001



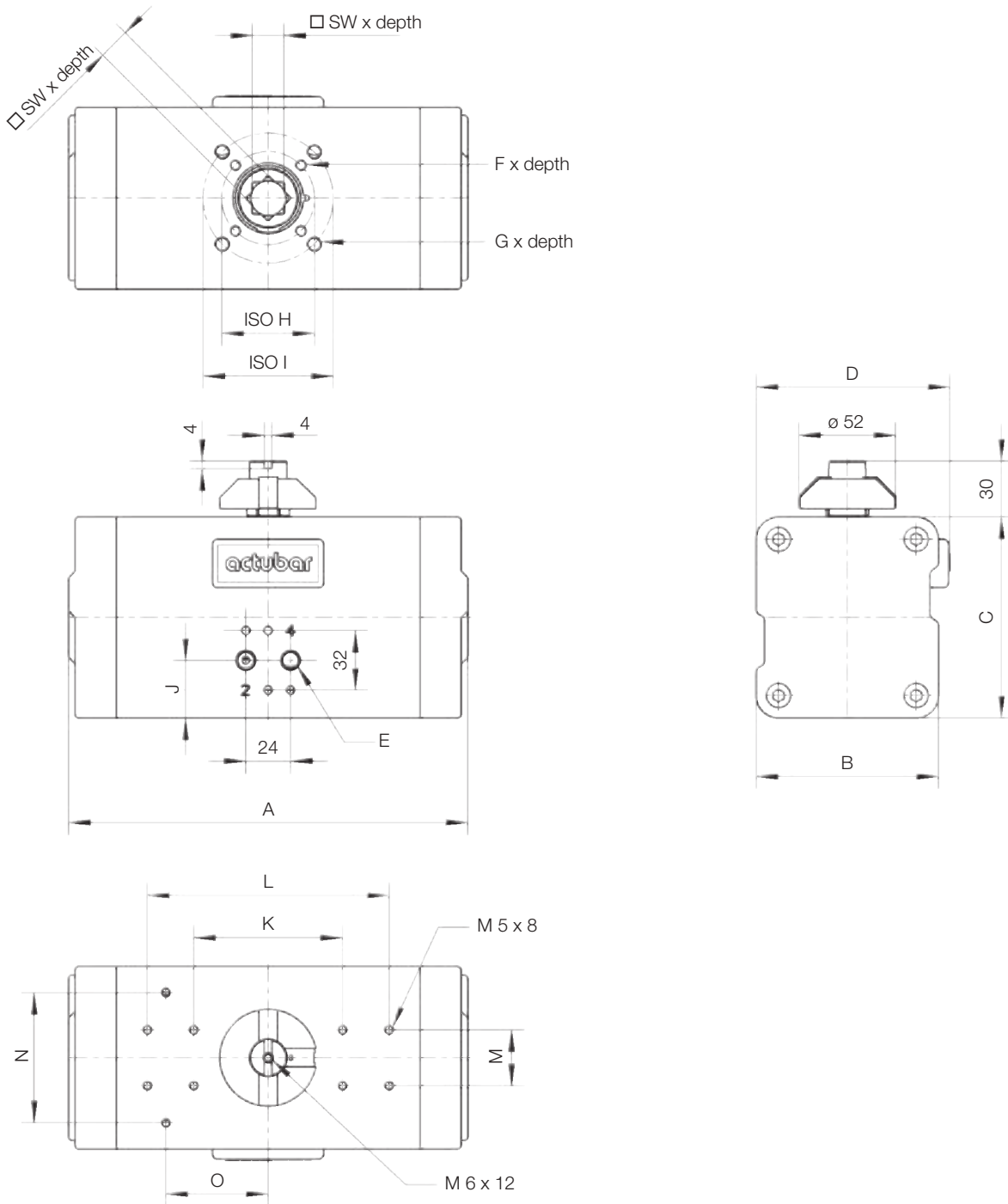
Dimensioned drawings for actubar type AD/AS-002



Dimensioned drawings for actubar types AD/AS-004 and -006

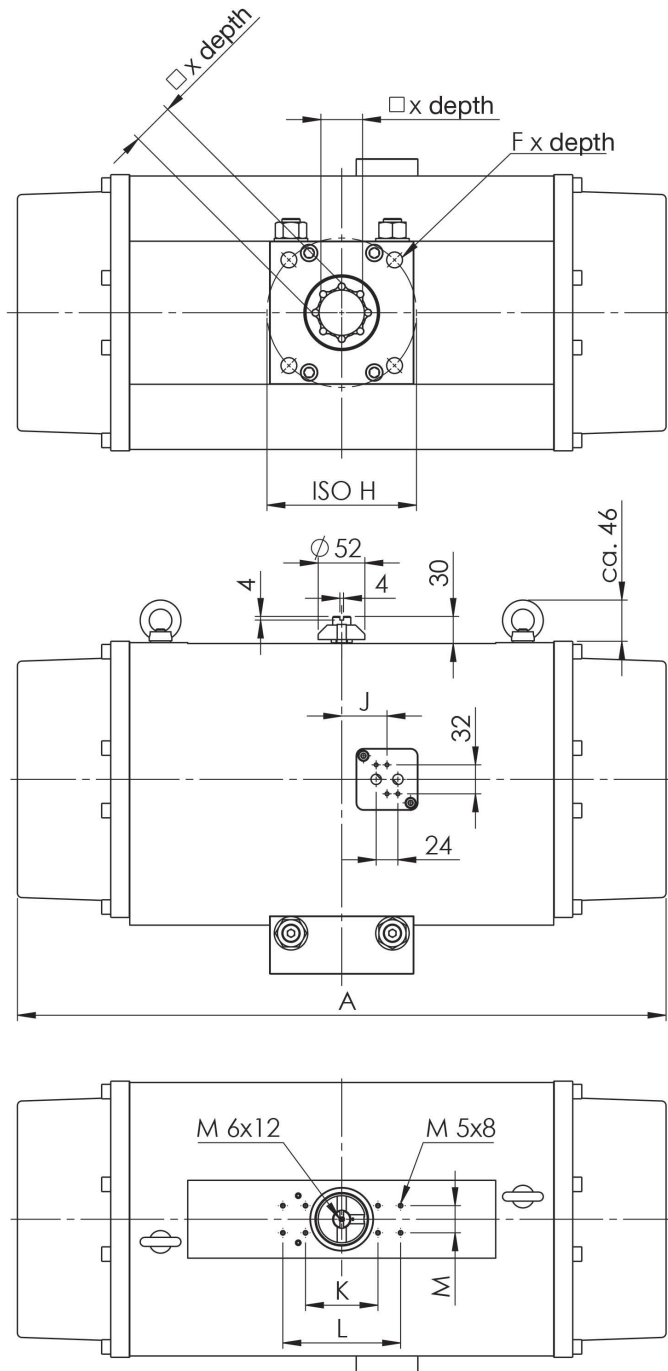


Dimensioned drawings for actubar types AD/AS-008 to -230



Dimensioned drawings for actubar types AD/AS-360 to -1200

Type AD/AS-360 to AD/AS-520



Type AD/AS-800 to AD/AS-1200

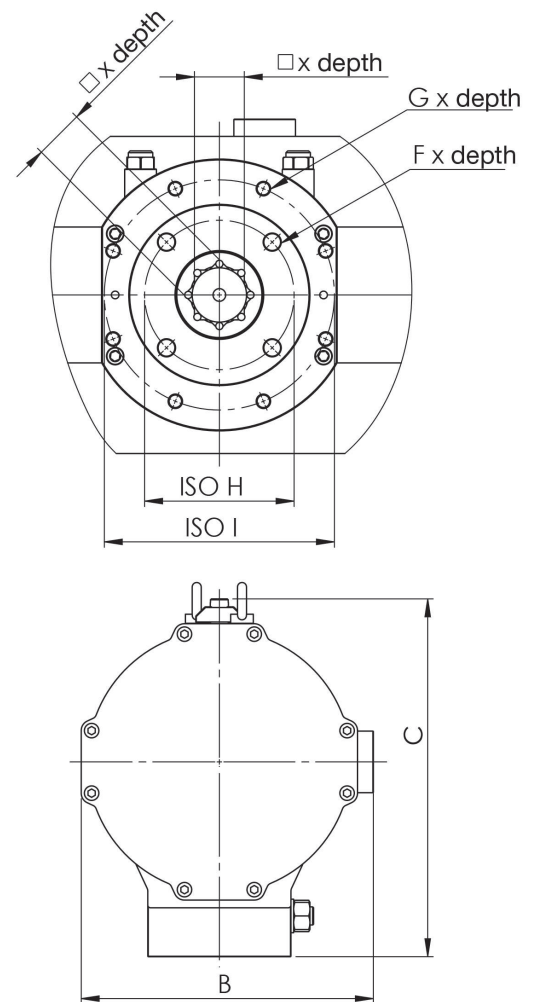


Table of dimensions

Type AD/AS	A	B	C	D	E	F x depth	G x depth	ISO H	ISO I	J	K	L	M	N	O	SW x depth
001	80	45	45		G 1/8"	M5x8		ø36/F03		22,5	50		25			9x12
002	134	59	59		G 1/8"	M5x8	M6x9	ø36/F03	ø50/F05	27,5	50		25			11x13
004	144	68	68	82	G 1/8"	M5x8	M6x9	ø36/F03	ø50/F05	24	80		30			14x17
006	159	76	84	90	G 1/8"	M6x9	M8x12	ø36/F03	ø70/F07	32	80		30			14x17
008	173	98	108	109	G 1/8"	M6x9	M8x12	ø50/F05	ø70/F07	31	80		30			14x17
011	215	98	108	109	G 1/8"	M6x9	M8x12	ø50/F05	ø70/F07	31	80	130	30	70	55	17x20
018	213	114	132	127	G 1/4"	M6x9	M8x12	ø50/F05	ø70/F07	36,5	80	130	30	70	55	17x20
026	281	114	132	127	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	36,5	80	130	30	70	55	22x25
037	266	138	161	155	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	40,5	80	130	30	70	55	22x25
050	347	138	161	155	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	40,5	80	130	30	70	55	22x25
076	329	176	200	196	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	50	80	130	30	70	55	27x30
110	475	176	200	196	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	50	80	130	30	70	55	27x30
160	516	199	220	225	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	60	80	130	30	70	55	27x30
230	560	223	244	249	G 1/4"	M16x24		ø140/F14		72	80	130	30	70	55	36x40
360	696	278	320	-	G 1/4"	M20x30		ø165/F16		50	80	130	30	-	-	46X50
520	716	323	368	-	G 1/4"	M20x30		ø165/F16		50	80	130	30	-	-	46X50
800	725	371	424	-	G 1/2"	M20x28	M16x30	ø165/F16	ø254/F25	50	80	130	30	-	-	55X58
1200	953	431	486	-	G 1/2"	M16x30		ø254/F25		50	80	130	30	-	-	55X58

Double-acting actuators

Type AD	Weight [kg]	Volume/Double-stroke [L]
001	0,34	0,05
002	0,73	0,15
004	1,21	0,25
006	1,81	0,41
008	2,97	0,60
011	3,59	0,85
018	4,80	1,35
026	6,27	1,78
037	8,23	2,75
050	11,25	3,73
076	15,90	5,50
110	22,94	8,50
160	27,46	11,90
230	38,10	16,90
360	55,00	25,00
520	71,00	37,00
800	101,00	53,00
1200	166	93,00

Single-acting actuators

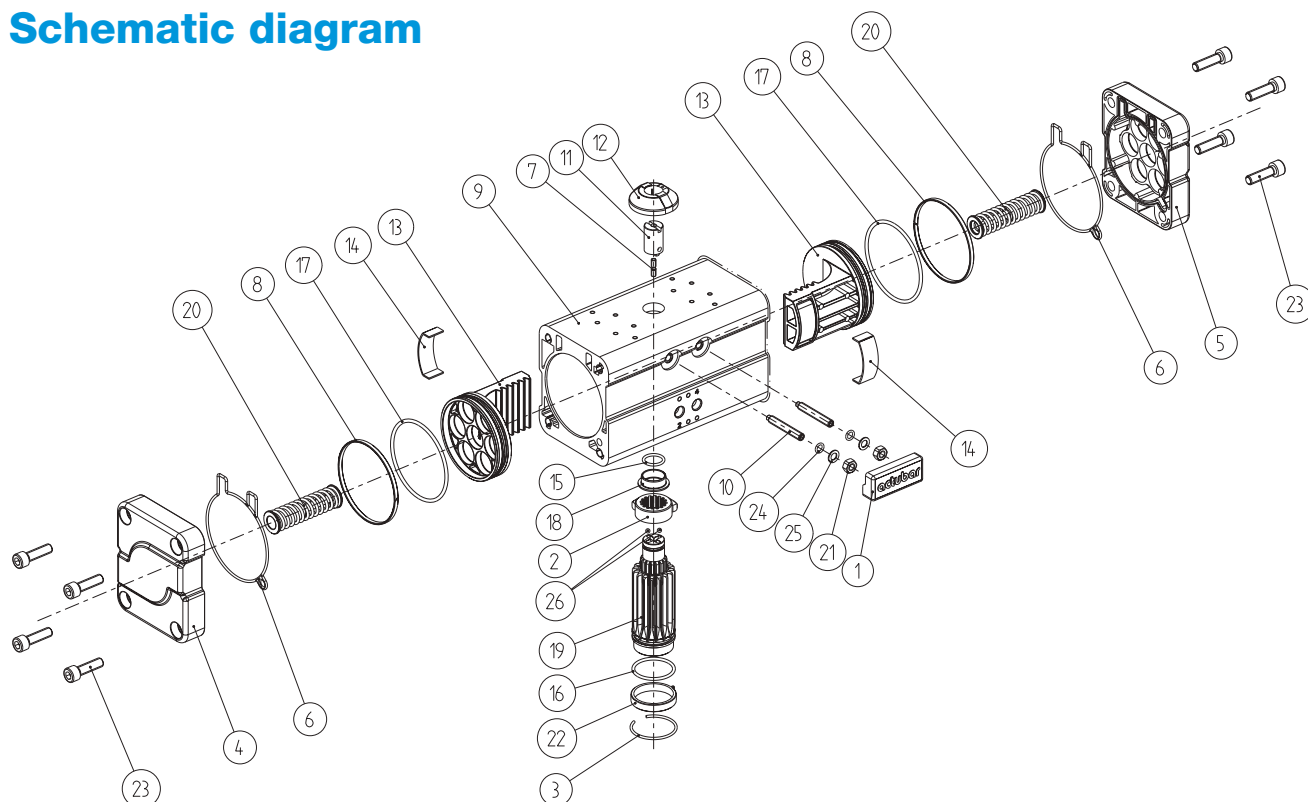
Type AS	Weight* [kg]	Volume/Double-stroke [L]
002	0,84	0,06
004	1,38	0,09
006	2,04	0,19
008	3,13	0,20
011	3,89	0,33
018	5,28	0,50
026	6,93	0,73
037	9,43	1,15
050	12,81	1,63
076	18,66	2,30
110	27,02	3,50
160	33,30	4,80
230	45,20	7,00
360	67,00	10,00
520	90,20	15,00
800	120,20	23,00
1200	214	38,00

* Single-acting actuators

Parts AD/AS-004 to AD/AS-230

1	Cover cap	8	O-Ring	15	O-Ring	22	Lower sliding ring
2	End-stop cam	9	Casing	16	O-Ring	23	Cap screw
3	Ring clip	10	Threaded pin	17	Piston guidance ring	24	O-Ring
4	End cap left	11	Namur shaft	18	Upper sliding ring	25	Washer
5	End cap right	12	Visual display	19	Pinion	26	Position indication balls
6	End cap seal	13	Piston	20	Spring		
7	Threaded pin	14	Guidance segment	21	Lock-nut		

Schematic diagram



Ordering code (example)

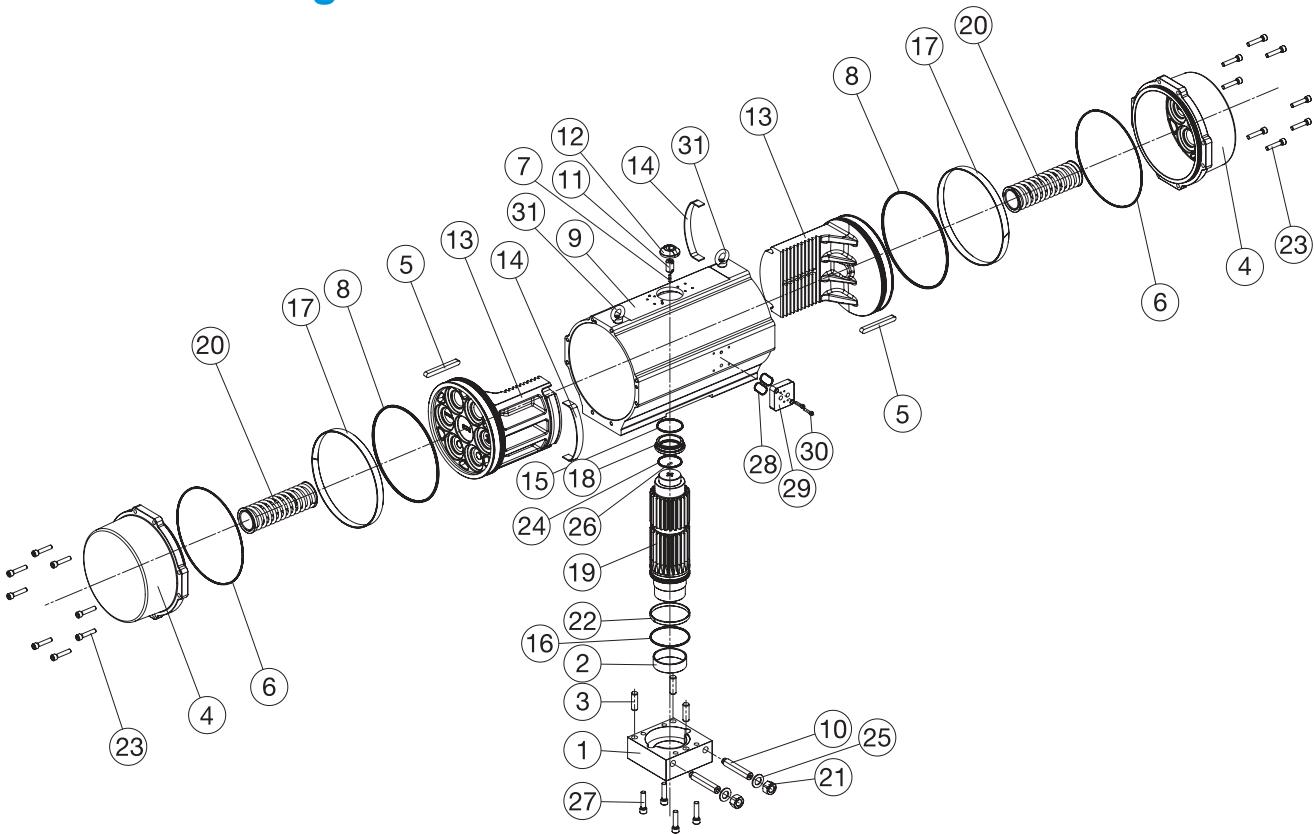
A S	-	0 5 0	/	0 9 0	-	0 8	-	V22	F
A D	-	0 5 0	/	0 9 0	-		-	Z...	A
Function S = single D = double		Type		Pivoting angle 90°		No. springs		Pinion model *	Mounting type Page 3

* **V** = octagonal with measurements **Z** = double-D with dimensions given

Parts AD/AS-350 to AD/AS-1200

1	Flange plate	9	Housing	17	Piston guidance ring	25	Washer
2	Layer	10	Threaded pin	18	Upper sliding ring	26	Position indication balls
3	Straight pin	11	Namur shaft	19	Pinion	27	Flange screws
4	Cap	12	Visual display	20	Spring	28	O-ring
5	Feather key	13	Piston	21	Lock-nut	29	NAMUR-adaptor plate screws
6	Cap sealing	14	Guidance segment	22	Lower sliding ring	30	Ring nut
7	Threaded pin	15	O-Ring	23	Cap screw	31	
8	O-Ring	16	O-Ring	24	O-Ring		

Schematic diagram



Product description

actubar is the latest generation in our range of pneumatic actuators. Externally unmistakable and technically unique, the actubar offers new advantages and uses. Technically speaking, actubar is the main component in the novel valve control system bar-va-cotrol.

Working together with our directly-mountable system components as bar-positurn or any other positioner of the system for actubar is monitoring and regulating automatic valves economically and effectively.

Objective

The hydraulic damper is an additional module for lengthening the actuation time. An evenly constant actuation speed is achieved through a piston which oscillates inside a cylinder containing hydraulic medium.

Torque remains the same and sudden movements are avoided so that pipework, valves and actuator are intrinsically protected.

Hydraulic dampers are deployed where there are slamming valves such as double-eccentric butterfly valves and used for preventing water surges.



And furthermore, it is possible to dictate whether the damping effect is only present at the end positions or ensures an even speed over the whole pivoting angle.

Layout of the hydraulic damper is compact. The module has been designed and constructed to be secure against manipulation, so that unplanned changes in the settings are not possible.

Deployment

This unique construction of the actubar allows addition of components in accordance with VDI/VDE 3847 and best of all, without hoses or pipework.

- control and end switch boxes with solenoid valves can be added directly without additional piping and together form a compact unit with the actubar
- all commercially available signalling units can be enhanced using the standardised interface VDI/VDE 3845
- end positions are adjustable between +5° and -10° in the 0° – and 90° position
- flexible automation of valves via various ISO-F flange faces per actuator size
- optional coatings and materials enable deployment even in aggressive environments
- long service life is achieved through slide bearings on all moving parts
- an internal octagon in the pinion enables actubar to be universally mounted onto valves with parallel or diagonal switching angle position
- the blowout-safe pinion minimizes danger of accidents
- extremely long switching times can be achieved
- a smooth, even movement of the valve is assured independent of the operating conditions
- a soft arrival at the end position is achieved

Technical data

	Standard model	Options available
Description	pneumatic double piston actuator-with additional hydraulic piston type AD = double-acting	
Constructional features	rack and pinion principle with self-centering piston guides in the housing	
Mounting position	as desired	
Normen	interface actuator/signal unit: acc. to VDI/VDE 3845 (NAMUR) and VDI/VDE 3847 interface actuator/control valve: acc. to NAMUR i.e. VDI/VDE 3845 interface actuator/valve: 4 i.e. 8 internal threaded in actuator housing acc. to EN ISO 5211	differing mounting and connecting dimensions possible pinion optional with internal double-D acc. to EN ISO 5211 or on request
Materials	casing: Aluminium-alloy, anodized damperhousing: Aluminium-alloy, anodized cap: Aluminium-alloy, anodized, powder-coated piston/Racks: Aluminium-alloy pinion: steel corrosion-protected seals: NBR bearings: easy sliding plastics screws: stainless steel	casing: anodized; coated with: powder-coated; PTFE cap coated with: PTFE pinion: Stainless steel AISI 303; AISI 316 seals: FKM
Ambient temperature	-20 °C to +80 °C	different temperature range on request
Rated pivoting angle	double acting: 90° rated pivoting angle as standard from +5° to -10° adjustable in both end positions	
Torque	2,5 Nm to 6.000 Nm	
Control pressure	2 to 8 bar	
Control medium / quality	filtered air in respect to remaining oil content, dust and water minimum acc. to DIN ISO 8573 – 1 class 4	also upon request: other non-aggressive gaseous or liquid mediums

bar-agturn[®]

The versatile pneumatic actuator



www.bar-gmbh.de

bar
A **WATTS** Brand

Objective

With 40 years of experience in automation we are able to meet the current requirements of the valve market and together with the bar-acturn we have developed a new pneumatic quarter-turn actuator for our diverse customer groups.

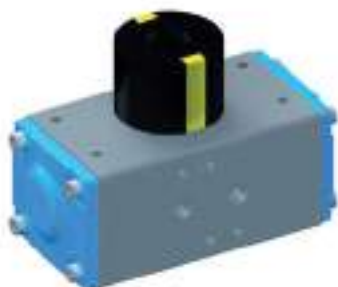
Thanks to its special design, robust construction and great versatility in technical characteristics, we fulfil the demands from the plant designer and plant manufacturer to the user.

This covers a very wide range of torque values and swivel angles.

Use

- a suitable rotary actuator is available for each application of shut-off valves due to 18 different sizes and torques from 2 to 13.040 Nm
- the high-quality powder coating of the cap and casing made of hard-coated aluminium allows the usage even in aggressive environmental conditions
- the solenoid valve interface is located high on the profile and easily accessible which optimizes the installation of pilot valves
- the end position adjustment on the opposite side of the solenoid valve connection facilitates the adjustment process
- the standardised interface VDI/VDE 3845 can be used to set up all commercially available signal and control devices
- the position indicator is part of the product which is equipped with variable clips for displaying the valve position
- the end positions can be configured between 0° and 90° as well as from + 5° to -5°, whereby the valve can be optimally adjusted
- there are 2 ISO flange patterns available for most of the sizes per each actuator size to ensure flexible automation of valves
- the octagonal pinion connection adapts a parallel or diagonal selector shaft alignment of the valve and ensures a space-saving actuator construction
- simple assembly and disassembly of the safety springs which are designed for a balanced ratio between pneumatic torque and spring torque
- each control pressure is assigned to a defined number of springs and facilitates the actuator selection based on the torques
- a laser engraving on the actuator casing marks the flange patterns and air connections for a clear allocation
- the serial number is also laser engraved; this helps to trace the actuator manufacturing at any time
- precisely milled piston tooth system ensures smoother running, optimum torque and low wear
- a long service life is achieved by using the plain bearing for all moving parts
- the actuators cover a wide range of applications thanks to the actuator variants with different swivel angles
- a reduced stock level is achieved by using identical caps for single- and double-acting actuators
- the unmistakable design is patent-protected and guarantees the original actuator type with a design based on the principle „Form follows function“
- elevated failsafe performance by our SIL 3 certified actuators

Type GD-032



Type GD/GS-040 to -270



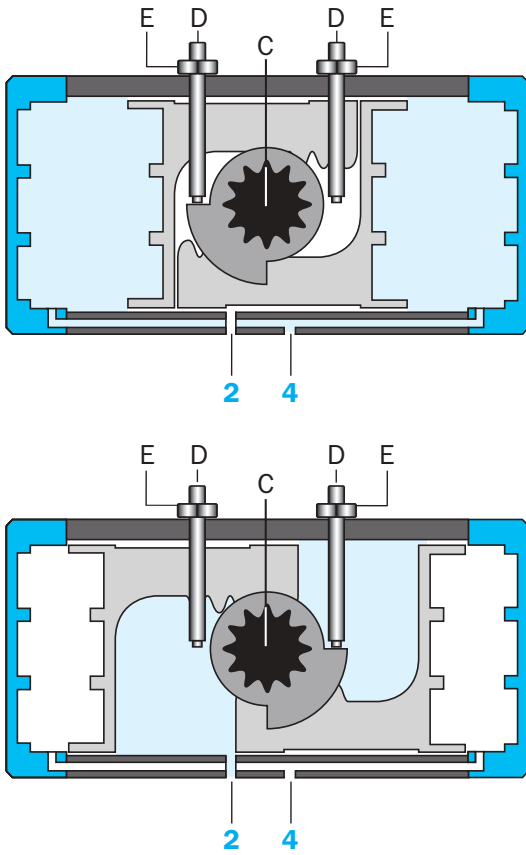
Type GD/GS-300 to -400



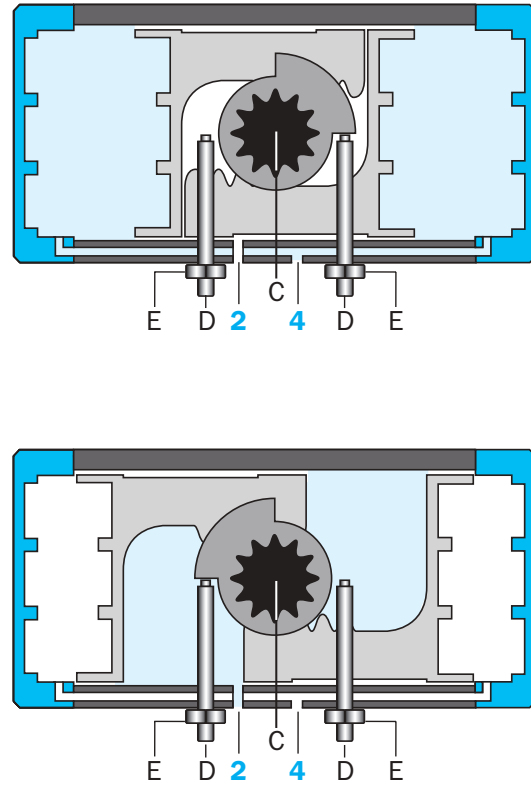
Technical data

	Standard model	Options available
Construction type	pneumatic twin-piston quarter-turn actuator type GD = double-acting type GS = single-acting (with spring return)	
Design features	rack-and-pinion principle with self-centering piston guide in the casing; single-acting: with safety springs	
Installation position	any desired	
Standards	connection point actuator signal device: acc. to VDI/VDE 3845 (NAMUR) connection point actuator/control valve: acc. to NAMUR or VDI/VDE 3845 connection point actuator/valve: four or eight internal threads in the actuator casing: acc. to EN ISO 5211	different mounting and connection dimensions are possible actuator pinion optionally with double-D bore according to EN ISO 5211 or according to customer requirements
Materials	casing: aluminium-alloy, hard anodized cap: aluminium-alloy, powder-coated piston/rack: aluminium-alloy pinion: corrosion-protected steel seals: NBR bearings: made of plastic with very good sliding properties screws: stainless steel A2	casing coating: powder-coated; PTFE cap coating: PTFE pinion: stainless steel 303; AISI 316 seals: FKM
Ambient temperature	-20 °C to +80 °C	low temperature design: -40 °C to +80 °C high temperature design: -20 °C to +160 °C
Nominal pivoting angle	double-acting: 90°, 120°, 180° single-acting: 90° nominal pivoting angle can be adjusted as standard from + 5° to -5° in both end positions	differing rotating angles, e.g. 135° swivel angle limitation up to 100 %
Torque	2 to 13.040 Nm	
Control pressure	2 to 8 bar	
Control medium / Quality	filtered air with regard to residual oil content, dust and water minimum according to DIN ISO 8573-1: 2010 [7:-:4]	upon request also can be operated with other non-aggressive, gaseous or liquid media
Certificates	SIL 3 by TÜV Rheinland, test basis IEC 61508 Parts 1-2 and 4-7:2010	

**Function double-acting
GD-032 to -210**

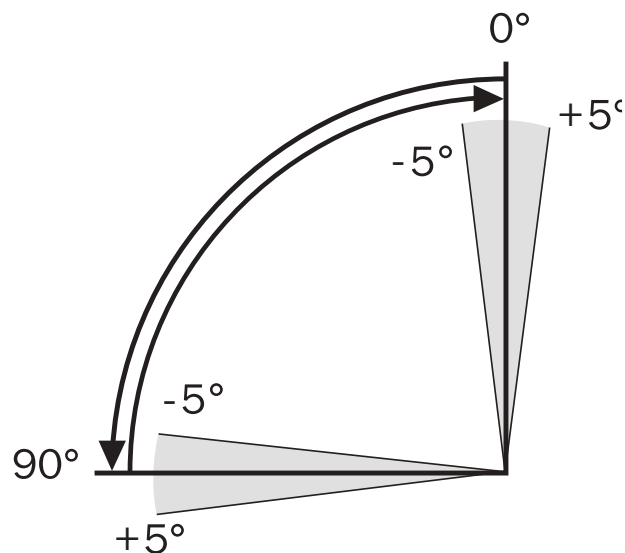


**Function double-acting
GD-240 to -400**

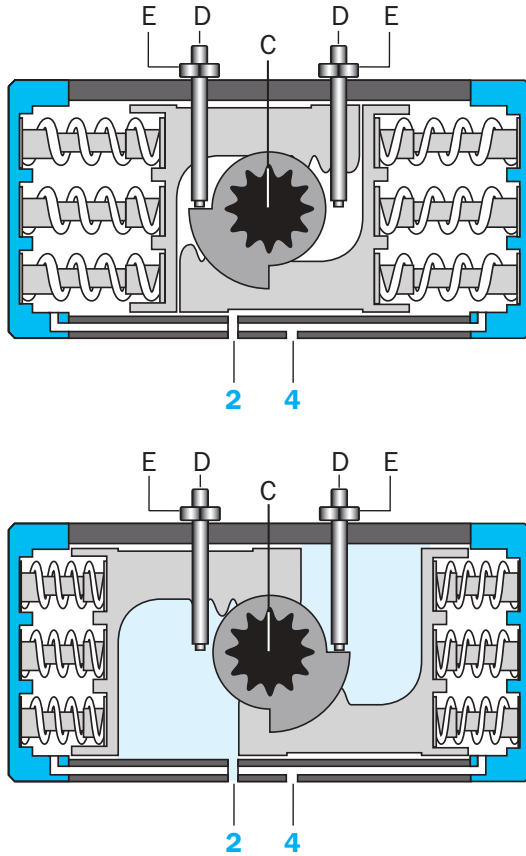


If the two outer chambers are pressurised via connection „4“, the pistons move towards each other into the basic position (0°). The force of both pistons is transmitted to the pinion „C“ via the racks. If connection „2“ is pressurised and connection „4“ is vented, the pistons move apart into the 90° position.

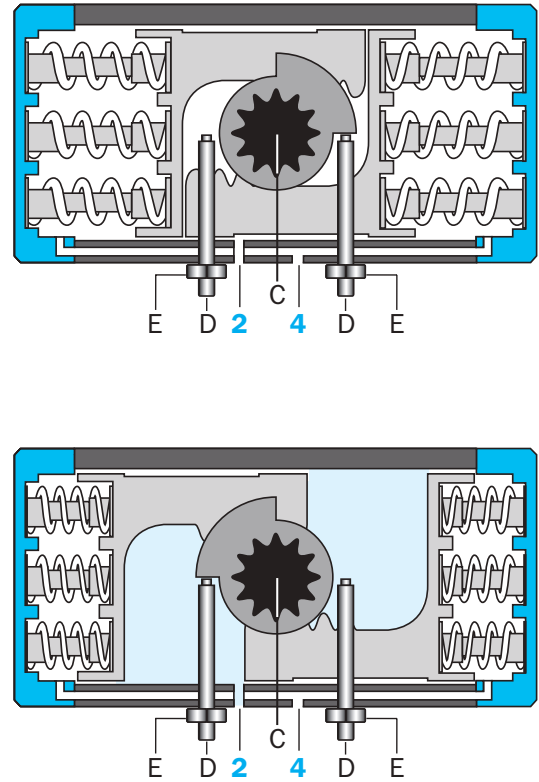
The pivoting angle can be adjusted between + 5° and - 5° in a pressureless state in both positions with the end position adjustment screws „D“ and secured with the lock nut „E“.



**Function single-acting
GS-052 to -210**



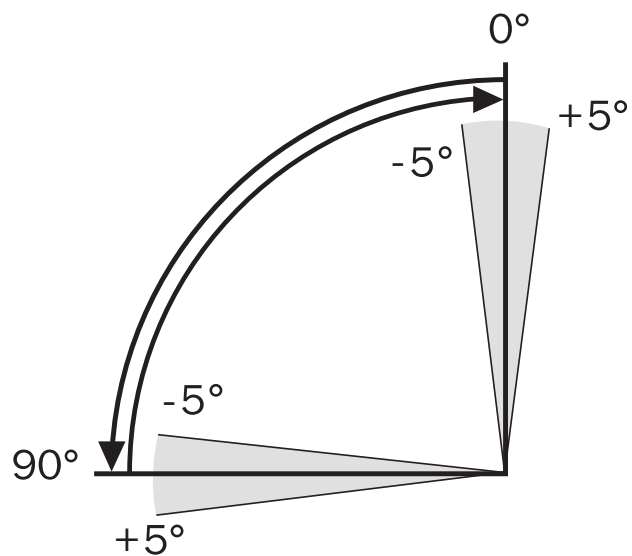
**Function single-acting
GS-240 to -400**



In the single-acting model the springs push the pistons back into the basic position and air is exhausted from connection „2“.

The number of springs can be adapted to the available control pressure.

The setting of the end positions is carried out as described under „Function double-acting“.



Torques double-acting actuators, type GD [Nm]

When determining the actuator sizes, a safety factor for the valve must always be taken into account. The recommended safety factor is minimum 30%. Since this safety factor is subject to the operating conditions, the required safety factor may possibly be much higher.

Type	Pneumatic applied torque Md N [Nm] at minimum control pressure P _{st} [bar]										
	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8
GD-032	3	4	5	5	6	7	8	8	9	11	12
GD-040	5	6	7	8	10	11	12	13	14	17	19
GD-052	8	10	12	14	16	18	20	22	24	28	32
GD-063	14	18	21	25	28	32	35	39	42	49	56
GD-075	20	25	30	35	40	45	50	55	60	70	79
GD-083	31	38	46	53	61	69	76	84	92	107	122
GD-092	45	56	67	79	90	101	112	124	135	157	180
GD-105	65	81	98	114	130	146	163	179	195	228	260
GD-125	101	127	152	178	203	228	254	279	304	355	406
GD-140	174	217	260	304	347	390	434	477	521	607	694
GD-160	264	331	397	463	529	595	661	727	793	925	1058
GD-190	426	533	639	746	852	959	1066	1172	1279	1492	1705
GD-210	521	651	781	911	1041	1171	1302	1432	1562	1822	2082
GD-240	765	956	1148	1339	1530	1721	1913	2104	2295	2678	3060
GD-270	1162	1453	1743	2034	2324	2615	2905	3196	3486	4067	4648
GD-300	1594	1993	2391	2790	3188	3587	3985	4384	4782	5579	6376
GD-350	2387	2983	3580	4177	4773	5370	5967	6563	7160	8353	9546
GD-400	3256	4070	4884	5698	6512	7326	8140	8954	9768	11396	13024

Torques – single-acting actuators, type GS [Nm]

When determining the actuator sizes, a safety factor for the valve must always be taken into account. The recommended safety factor is minimum 30%. Since this safety factor is subject to the operating conditions, the required safety factor may possibly be much higher.

The colour-marked torques have a balanced ratio between air and spring torque.

Type	Spring code	Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure P _{st} [bar]																							
		Md F [Nm]		Md N [Nm]																							
		min	max	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	7,0	8,0													
GS-052	1	0,8	1,2	6,8	7,2	8,8	9,2	10,8	11,2	12,8	13,2	14,8	15,2	16,8	17,2	18,8	19,2	20,8	21,2	22,8	23,2	26,8	27,1	30,8	31,1		
	2	1,6	2,4	5,6	6,4	7,6	8,4	9,6	10,4	11,6	12,3	13,6	14,3	15,6	16,3	17,6	18,3	19,6	20,3	21,6	22,3	25,6	26,3	29,6	30,3		
	3	2,5	3,6	4,4	5,5	6,4	7,5	8,4	9,5	10,4	11,5	12,4	13,5	14,4	15,5	16,4	17,5	18,4	19,5	20,4	21,5	24,4	25,5	28,4	29,5		
	4	3,3	4,7	3,2	4,7	5,2	6,7	7,2	8,7	9,2	10,7	11,2	12,7	13,2	14,7	15,2	16,7	17,2	18,7	19,2	20,7	23,2	24,7	27,2	28,7		
	5	4,1	5,9	2,1	3,9	4,1	5,9	6,1	7,9	8,0	9,9	10,0	11,9	12,0	13,9	14,0	15,9	16,0	17,9	18,0	19,9	22,0	23,9	26,0	27,9		
	6	4,9	7,1	0,9	3,1	2,9	5,1	4,9	7,1	6,9	9,1	8,9	11,1	10,9	13,1	12,9	15,1	14,9	17,1	16,8	19,1	20,8	23,1	24,8	27,1		
	7	5,7	8,3			1,7	4,3	3,7	6,3	5,7	8,3	7,7	10,3	9,7	12,3	11,7	14,3	13,7	16,3	15,7	18,3	19,7	22,2	23,7	26,2		
	8	6,5	9,5					2,5	5,4	4,5	7,4	6,5	9,4	8,5	11,4	10,5	13,4	12,5	15,4	14,5	17,4	18,5	21,4	22,5	25,4		
	9	7,4	10,7					1,3	4,6	3,3	6,6	5,3	8,6	7,3	10,6	9,3	12,6	11,3	14,6	13,3	16,6	17,3	20,6	21,3	24,6		
	10	8,2	11,9							2,1	5,8	4,1	7,8	6,1	9,8	8,1	11,8	10,1	13,8	12,1	15,8	16,1	19,8	20,1	23,8		
	11	9,0	13,1								2,9	7,0	4,9	9,0	6,9	11,0	8,9	13,0	10,9	15,0	14,9	19,0	18,9	23,0			
	12	9,8	14,2								1,7	6,2	3,7	8,2	5,7	10,2	7,7	12,2	9,7	14,2	13,7	18,2	17,7	22,2			
GS-063	1	1,4	2,1	12,0	12,6	15,5	16,1	19,0	19,7	22,5	23,2	26,0	26,7	29,5	30,2	33,1	33,7	36,6	37,2	40,1	40,7	47,1	47,8	54,2	54,8		
	2	2,9	4,2	9,9	11,2	13,4	14,7	16,9	18,2	20,4	21,7	23,9	25,2	27,5	28,8	31,0	32,3	34,5	35,8	38,0	39,3	45,0	46,3	52,1	53,4		
	3	4,3	6,3	7,8	9,7	11,3	13,3	14,8	16,8	18,3	20,3	21,9	23,8	25,4	27,3	28,9	30,8	32,4	34,3	35,9	37,9	42,9	44,9	50,0	51,9		
	4	5,8	8,4	5,7	8,3	9,2	11,8	12,7	15,3	16,2	18,8	19,8	22,4	23,3	25,9	26,8	29,4	30,3	32,9	33,8	36,4	40,9	43,5	47,9	50,5		
	5	7,2	10,5	3,6	6,9	7,1	10,4	10,6	13,9	14,2	17,4	17,7	20,9	21,2	24,4	24,7	28,0	28,2	31,5	31,7	35,0	38,8	42,0	45,8	49,0		
	6	8,6	12,5	1,5	5,4	5,0	8,9	8,6	12,5	12,1	16,0	15,6	19,5	19,1	23,0	22,6	26,5	26,1	30,0	29,6	33,5	36,7	40,6	43,7	47,6		
	7	10,1	14,6			2,9	7,5	6,5	11,0	10,0	14,5	13,5	18,0	17,0	21,6	20,5	25,1	24,0	28,6	27,6	32,1	34,6	39,1	41,6	46,2		
	8	11,5	16,7					4,4	9,6	7,9	13,1	11,4	16,6	14,9	20,1	18,4	23,6	21,9	27,1	25,5	30,7	32,5	37,7	39,5	44,7		
	9	13,0	18,8					2,3	8,1	5,8	11,6	9,3	15,2	12,8	18,7	16,3	22,2	19,9	25,7	23,4	29,2	30,4	36,3	37,4	43,3		
	10	14,4	20,9						3,7	10,2	7,2	13,7	10,7	17,2	14,3	20,8	17,8	24,3	21,3	27,8	28,3	34,8	35,3	41,8			
	11	15,8	23,0							5,1	12,3	8,6	15,8	12,2	19,3	15,7	22,8	19,2	26,3	26,2	33,4	33,3	40,4				
	12	17,3	25,1								3,0	10,8	6,6	14,4	10,1	17,9	13,6	21,4	17,1	24,9	24,1	31,9	31,2	39,0			

Torques – single-acting actuators, type GS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure Pst [bar]																					
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0	
Typ	Spring code	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
GS-075	1	2	3	17	18	22	23	27	28	32	33	37	38	42	43	47	48	52	53	57	58	67	68	77	78
	2	4	6	14	16	19	21	24	26	29	31	34	36	39	41	44	46	49	51	54	56	64	66	74	76
	3	6	9	11	14	16	19	21	24	26	29	31	34	36	39	41	44	46	49	51	54	61	64	71	73
	4	8	12	8	12	13	17	18	22	23	27	28	32	33	37	38	42	43	47	48	52	58	61	68	71
	5	10	15	5	10	10	15	15	20	20	25	25	30	30	35	35	40	40	45	45	49	55	59	65	69
	6	12	18	2	8	7	13	12	18	17	23	22	28	27	33	32	37	37	42	42	47	52	57	62	67
	7	14	21			4	11	9	16	14	21	19	25	24	30	29	35	34	40	39	45	49	55	59	65
	8	16	24					6	14	11	18	16	23	21	28	26	33	31	38	36	43	46	53	56	63
	9	18	27					3	11	8	16	13	21	18	26	23	31	28	36	33	41	43	51	53	61
	10	20	30							5	14	10	19	15	24	20	29	25	34	30	39	40	49	50	59
	11	22	33									7	17	12	22	17	27	22	32	27	37	37	47	47	57
	12	25	36									4	15	9	20	14	25	19	30	24	35	34	45	44	55
GS-083	1	3	5	26	27	34	35	41	43	49	50	56	58	64	65	72	73	79	81	87	88	102	104	117	119
	2	6	9	21	24	29	32	37	39	44	47	52	55	60	62	67	70	75	78	82	85	98	100	113	116
	3	9	14	17	21	25	29	32	36	40	44	47	52	55	59	63	67	70	74	78	82	93	97	108	113
	4	13	18	12	18	20	26	28	33	35	41	43	48	50	56	58	64	66	71	73	79	89	94	104	109
	5	16	23	8	15	15	22	23	30	31	38	38	45	46	53	54	61	61	68	69	76	84	91	99	106
	6	19	27	3	12	11	19	19	27	26	35	34	42	41	50	49	57	57	65	64	73	80	88	95	103
	7	22	32			6	16	14	24	22	31	29	39	37	47	45	54	52	62	60	70	75	85	90	100
	8	25	36					9	21	17	28	25	36	32	44	40	51	48	59	55	66	70	82	86	97
	9	28	41					5	18	13	25	20	33	28	40	35	48	43	56	51	63	66	79	81	94
	10	31	45							8	22	16	30	23	37	31	45	39	53	46	60	61	75	77	91
	11	34	50									11	27	19	34	26	42	34	49	42	57	57	72	72	88
	12	38	54									7	23	14	31	22	39	29	46	37	54	52	69	68	84
GS-092	1	5	7	38	40	49	52	61	63	72	74	83	85	94	97	106	108	117	119	128	130	151	153	173	175
	2	9	13	32	36	43	47	54	58	65	69	77	81	88	92	99	103	110	114	121	126	144	148	166	171
	3	14	20	25	31	36	42	47	54	59	65	70	76	81	87	92	99	104	110	115	121	137	143	160	166
	4	18	27	18	27	29	38	41	49	52	60	63	71	74	83	86	94	97	105	108	116	131	139	153	161
	5	23	33	11	22	23	33	34	44	45	56	56	67	68	78	79	89	90	101	101	112	124	134	146	157
	6	28	40	5	17	16	29	27	40	39	51	50	62	61	73	72	85	83	96	95	107	117	130	140	152
	7	32	47			9	24	21	35	32	46	43	58	54	69	66	80	77	91	88	103	110	125	133	147
	8	37	54			3	19	14	31	25	42	36	53	48	64	59	75	70	87	81	98	104	120	126	143
	9	41	60					7	26	18	37	30	48	41	60	52	71	63	82	75	93	97	116	120	138
	10	46	67							12	33	23	44	34	55	45	66	57	77	68	89	90	111	113	134
	11	51	74									16	39	28	50	39	62	50	73	61	84	84	107	106	129
	12	55	80									10	35	21	46	32	57	43	68	55	80	77	102	99	124
GS-105	1	7	10	55	58	72	75	88	91	104	107	120	123	137	140	153	156	169	172	185	188	218	221	250	253
	2	13	19	46	52	62	68	78	84	94	100	111	117	127	133	143	149	159	165	176	182	208	214	241	247
	3	20	29	36	45	52	61	68	77	85	94	101	110	117	126	133	142	150	159	166	175	198	207	231	240
	4	27	39	26	38	43	55	59	71	75	87	91	103	108	120	124	136	140	152	156	168	189	201	221	233
	5	33	48	17	32	33	48	49	64	65	80	82	97	98	113	114	129	130	145	147	162	179	194	212	227
	6	40	58	7	25	23	41	39	57	56	74	72	90	88	106	104	122	121	139	137	155	169	187	202	220
	7	47	68			13	34	30	51	46	67	62	83	78	99	95	116	111	132	127	148	160	181	192	213
	8	53	77					20	44	36	60	53	77	69	93	85	109	101	125	118	142	150	174	183	207
	9	60	87							27	54	43	70	59	86	75	102	92	119	108	135	140	167	173	200
	10	67	97							17	47	33	63	49	79	66	96	82	112	98	128	131	161	163	193
	11	73	106									24	57	40	73	56	89	72	105	89	122	121	154	154	187
	12	80	116									14	50	30	66	46	82	63	99	79	115	111	147	144	180
GS-125	1	10	15	86	91	112	116	137	142	162	167	188	192	213	218	239	243	264	269	289	294	340	345	391	395
	2	21	30	71	81	97	106	122	131	147	157	173	182	198	207	223	233	249	258	274	284	325	334	376	385
	3	31	45	56	70	82	96	107	121	132	146	158	172	183	197	208	222	234	248	259	273	310	324	360	375
	4	42	60	41	60	66	85	92	111	117	136	143	161	168	187	193	212	219	237	244	263	295	313	345	364
	5	52	75	26	49	51	75	77	100	102	126	127	151	153	176	178	202	204	227	229	252	280	303	330	354
	6	62	91	11	39	36	64	62	90	87	115	112	140	138	166	163	191	188	217	214	242	265	293	315	343
	7	73	106			21	54	47	79	72	105	97	130	123	155	148	181	173	206	199	232	249	282	300	333
	8	83	121					31	69	57	94	82	120	108	145	133	170	158	196	184	221	234	272	285	323
	9	94	136							42	84	67	109	92	135	118	160	143	185	169	211	219	261	270	312
	10	104	151							27	74	52	99	77	124	103	150	128	175	153	200	204	251	255	302
	11	114	166									37	88	62	114	88	139	113	165	138	190	189	241	240	291
	12	125	181									22	78	47	103	73	129	98	154	123	180	174	230	225	281

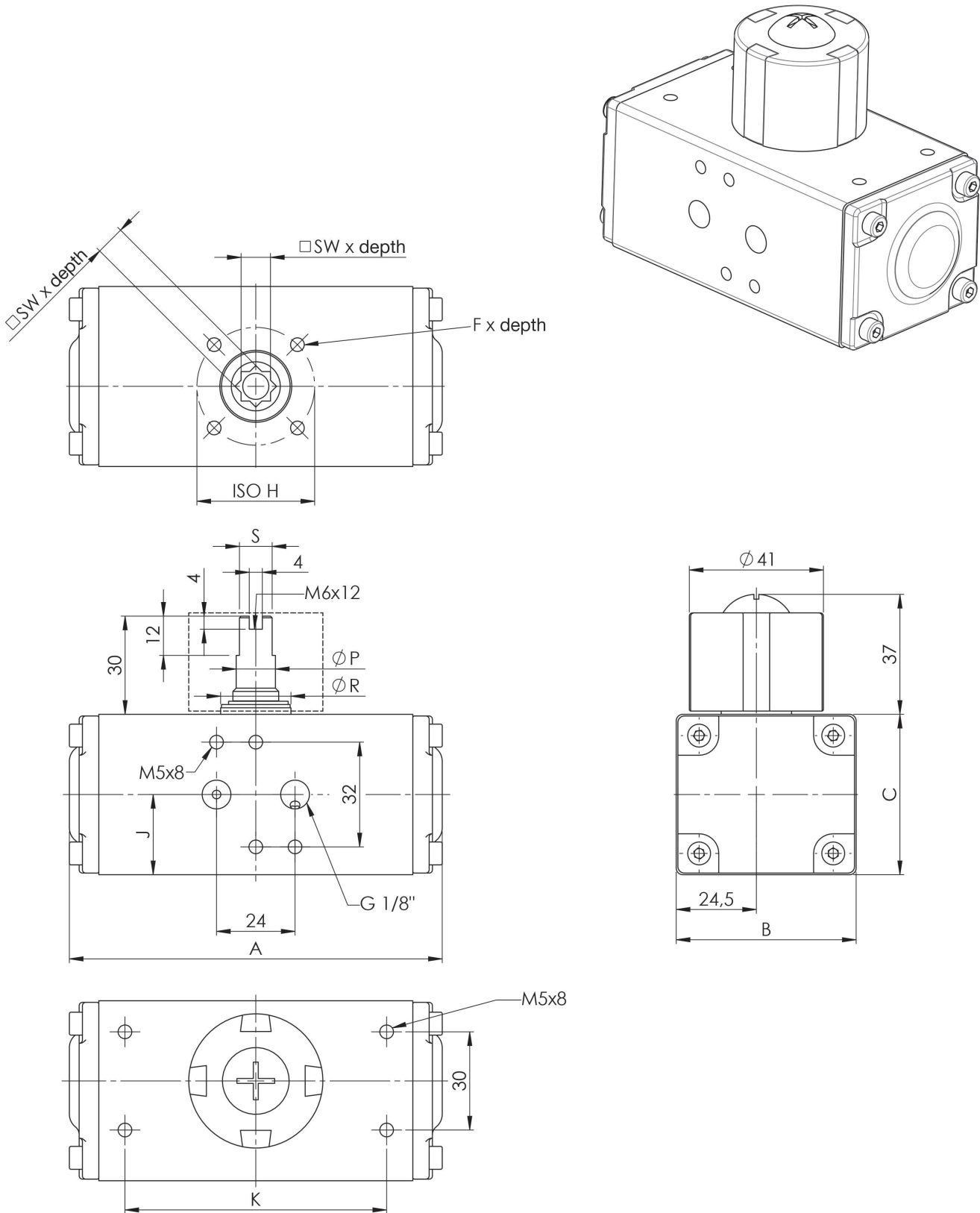
Torques – single-acting actuators, type GS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure Pst [bar]																							
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
Typ	Spring code	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
GS-140	1	18	26	148	156	191	199	234	242	278	286	321	329	365	373	408	416	451	459	495	503	581	589	668	676		
	2	36	52	122	138	165	181	209	225	252	268	295	311	339	355	382	398	425	442	469	485	556	572	642	658		
	3	53	77	96	120	139	164	183	207	226	250	270	294	313	337	356	380	400	424	443	467	530	554	617	641		
	4	71	103	70	102	114	146	157	189	200	233	244	276	287	319	330	363	374	406	417	449	504	536	591	623		
	5	89	129	44	85	88	128	131	171	175	215	218	258	261	302	305	345	348	388	391	432	478	518	565	605		
	6	107	155	19	67	62	110	105	154	149	197	192	240	235	284	279	327	322	371	366	414	452	501	539	587		
	7	124	181			36	93			80	136	123	179	166	223	210	266	253	309	296	353	340	396	427	483	513	570
	8	142	207					54	118	97	162	140	205	184	248	227	292	271	335	314	378	401	465	487	552		
	9	160	232						71	144	115	187	158	231	201	274	245	317	288	361	375	447	462	534			
	10	178	258						45	126	89	169	132	213	176	256	219	300	262	343	349	430	436	516			
	11	195	284								63	152	106	195	150	238	193	282	236	325	323	412	410	499			
	12	213	310								87	174	124	221	172	264	211	307	297	394	384	481					
GS-160	1	27	39	225	237	291	303	357	369	423	436	489	502	556	568	622	634	688	700	754	766	886	898	1018	1030		
	2	54	79	186	210	252	276	318	342	384	408	450	475	516	541	582	607	648	673	715	739	847	871	979	1003		
	3	81	118	146	183	212	249	279	315	345	381	411	447	477	514	543	580	609	646	675	712	807	844	940	976		
	4	108	157	107	156	173	222	239	288	305	354	371	420	438	486	504	553	570	619	636	685	768	817	900	949		
	5	136	197	68	129	134	195	200	261	266	327	332	393	398	459	464	525	530	592	597	658	729	790	861	922		
	6	163	236	28	102	94	168	161	234	227	300	293	366	359	432	425	498	491	564	557	631	689	763	822	895		
	7	190	275			55	141	121	207	187	273	253	339	320	405	386	471	452	537	518	603	650	736	782	868		
	8	217	315					82	180	148	246	214	312	280	378	346	444	412	510	478	576	611	709	743	841		
	9	244	354						109	219	175	285	241	351	307	417	373	483	439	549	571	681	704	814			
	10	271	393						69	192	135	258	202	324	268	390	334	456	400	522	532	654	664	787			
	11	298	433								96	231	162	297	228	363	294	429	360	495	493	627	625	759			
	12	325	472								123	270	189	336	255	402	321	468	453	600	586	732					
GS-190	1	44	63	363	383	469	489	576	596	683	702	789	809	896	915	1002	1022	1109	1129	1215	1235	1429	1448	1642	1661		
	2	87	127	299	339	406	445	513	552	619	659	726	765	832	872	939	978	1045	1085	1152	1191	1365	1405	1578	1618		
	3	131	190	236	295	343	402	449	508	556	615	662	721	769	828	876	935	982	1041	1089	1148	1302	1361	1515	1574		
	4	175	254	173	252	279	358	386	465	492	571	599	678	706	784	812	891	919	998	1025	1104	1238	1317	1452	1530		
	5	218	317	109	208	216	314	322	421	429	528	536	634	642	741	749	847	855	954	962	1060	1175	1274	1388	1487		
	6	262	380	46	164	152	271	259	377	366	484	472	590	579	697	685	804	792	910	898	1017	1112	1230	1325	1443		
	7	306	444			89	227	196	334	302	440	409	547	515	653	622	760	728	866	835	973	1048	1186	1261	1399		
	8	350	507					132	290	239	396	345	503	452	610	559	716	665	823	772	929	985	1142	1198	1356		
	9	393	571						175	353	282	459	389	566	495	672	602	779	708	886	921	1099	1135	1312			
	10	437	634						112	309	219	416	325	522	432	629	538	735	645	842	858	1055	1071	1268			
	11	481	697								155	372	262	479	368	585	475	692	581	798	795	1011	1008	1225			
	12	524	761								92	328	198	435	305	541	411	648	518	755	731	968	944	1181			
GS-210	1	53	77	443	467	573	597	703	728	834	858	964	988	1094	1118	1224	1248	1354	1378	1484	1508	1745	1769	2005	2029		
	2	107	155	366	414	496	544	626	674	756	804	886	934	1016	1065	1147	1195	1277	1325	1407	1455	1667	1715	1928	1976		
	3	160	232	288	361	418	491	549	621	679	751	809	881	939	1011	1069	1141	1199	1272	1329	1402	1590	1662	1850	1922		
	4	213	310	211	307	341	437	471	567	601	698	731	828	862	958	992	1088	1122	1218	1252	1348	1512	1609	1773	1869		
	5	267	387	133	254	264	384	394	514	524	644	654	774	784	905	914	1035	1044	1165	1175	1295	1435	1555	1695	1816		
	6	320	465	56	200	186	331	316	461	446	591	577	721	707	851	837	981	967	1111	1097	1242	1357	1502	1618	1762		
	7	374	542			109	277	239	407	369	537	499	668	629	798	759	928	890	1058	1020	1188	1280	1449	1540	1709		
	8	427	620					161	354	291	484	422	614	552	744	682	875	812	1005	942	1135	1203	1395	1463	1655		
	9	480	697						214	431	344	561	474	691	604	821	735	951	865	1082	1125	1342	1385	1602			
	10	534	775						137	377	267	508	397	638	527	768	657	898	787	1028	1048	1288	1308	1549			
	11	587	852								189	454	319	584	450	714	580	845	710	975	970	1235	1230	1495			
	12	640	929								112	401	242	531	372	661	502	791	632	921	893	1182	1153	1442			
GS-240	1	78	114	651	687	843	878	1034	1069	1225	1260	1416	1452	1608	1643	1799	1834	1990	2026	2181	2217	2564	2599	2947	2982		
	2	157	228	537	608	729	800	920	991	1111	1182	1303	1373	1494	1565	1685	1756	1876	1947	2068	2138	2450	2521	2833	2903		
	3	235	341	424	530	615	721	806	912	997	1104	1189	1295	1380	1486	1571	1677	1763	1869	1954	2060	2336	2443	2719	2825		
	4	314	455	310	451	501	643	692	834	884	1025	1075	1217	1266	1408	1458	1599	1649	1790	1840	1982	2223	2364	2605	2747		
	5	392	569	196	373	387	564	579	756	770	947	961	1138	1152	1329	1344	1521	1535	1712	1726	1903	2109	2286	2491	2668		
	6	470	683	82	295	274	486	465	677	656	868	847	1060	1039	1251	1230	1442	1421	1633	1612	1825	1995	2207	2378	2590		
	7	549	797			160	407	351	599	542	790	734	981	925	1173	1116	1364	1307	1555	1499	1746	1881	2129	2264	2511		
	8	627	910					237	520	428	712	620	903	811	1094	1002	1285	1194	1477	1385	1668	1767	2050	2150	2433		
	9	706	1024							315	633	506	824	697	1016	889	1207	1080	1398	1271	1590	1654	1972	2036	2355		
	10	784	1138						201	555	392	746	583	937	775	1129	966	1320	1157	1511	1540	1894	1922	2276			
	11	863	1252								278	668	470	859	661	1050	852	1241	1043	1433	1426	1815	1809	2198			
	12	941	1366								165	589	356	780	547	972	738	1163	930	1354	1312	1737	1695	2119			

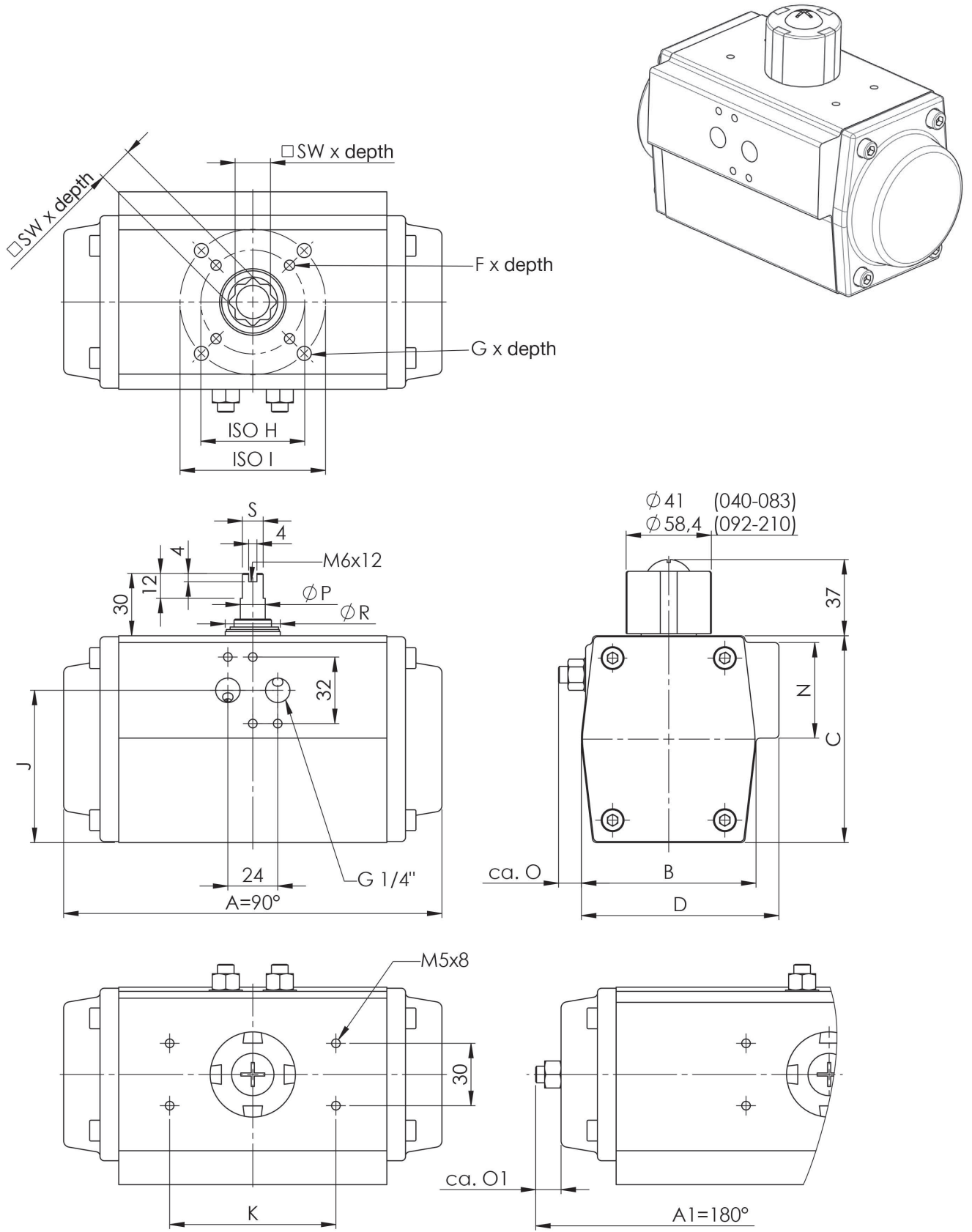
Torques – single-acting actuators, type GS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure Pst [bar]																							
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0			
Typ	Spring code	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
GS-270	1	119	173	989	1043	1280	1333	1570	1624	1860	1914	2151	2205	2441	2495	2732	2786	3022	3076	3313	3367	3894	3948	4475	4529		
	2	238	346	816	924	1107	1214	1397	1505	1688	1795	1978	2086	2269	2376	2559	2667	2850	2957	3140	3248	3721	3828	4302	4409		
	3	357	518	643	805	934	1095	1224	1386	1515	1676	1805	1967	2096	2257	2386	2547	2677	2838	2967	3128	3548	3709	4129	4290		
	4	476	691	471	686	761	976	1052	1266	1342	1557	1632	1847	1923	2138	2213	2428	2504	2719	2794	3009	3375	3590	3956	4171		
	5	596	864	298	566	588	857	879	1147	1169	1438	1460	1728	1750	2019	2041	2309	2331	2600	2622	2890	3203	3471	3783	4052		
	6	715	1037	125	447	415	738	706	1028	996	1319	1287	1609	1577	1900	1868	2190	2158	2481	2449	2771	3030	3352	3611	3933		
	7	834	1210			243	619	533	909	824	1200	1114	1490	1404	1781	1695	2071	1985	2362	2276	2652	2857	3233	3438	3814		
	8	953	1383					360	790	651	1081	941	1371	1232	1661	1522	1952	1813	2242	2103	2533	2684	3114	3265	3695		
	9	1072	1555							478	961	768	1252	1059	1542	1349	1833	1640	2123	1930	2414	2511	2995	3092	3576		
	10	1191	1728							305	842	596	1133	886	1423	1176	1714	1467	2004	1757	2295	2338	2876	2919	3457		
	11	1310	1901									423	1014	713	1304	1004	1595	1294	1885	1585	2176	2166	2757	2746	3338		
	12	1429	2074									250	895	540	1185	831	1476	1121	1766	1412	2057	1993	2637	2574	3218		
GS-300	1	163	237	1357	1431	1755	1829	2154	2227	2552	2626	2951	3024	3349	3423	3748	3821	4146	4220	4545	4618	5342	5415	6139	6212		
	2	327	474	1120	1267	1518	1666	1917	2064	2315	2463	2714	2861	3112	3260	3511	3658	3909	4056	4308	4455	5104	5252	5901	6049		
	3	490	711	883	1104	1281	1502	1680	1901	2078	2299	2477	2698	2875	3096	3273	3495	3672	3893	4070	4292	4867	5089	5664	5885		
	4	653	948	646	940	1044	1339	1443	1737	1841	2136	2239	2534	2638	2933	3036	3331	3435	3730	3833	4128	4630	4925	5427	5722		
	5	817	1185	408	777	807	1176	1205	1574	1604	1972	2002	2371	2401	2769	2799	3168	3198	3566	3596	3965	4393	4762	5190	5559		
	6	980	1423	171	614	570	1012	968	1411	1367	1809	1765	2208	2164	2606	2562	3005	2961	3403	3359	3801	4156	4598	4953	5395		
	7	1144	1660			333	849	731	1247	1130	1646	1528	2044	1927	2443	2325	2841	2724	3240	3122	3638	3919	4435	4716	5232		
	8	1307	1897					494	1084	893	1482	1291	1881	1690	2279	2088	2678	2487	3076	2885	3475	3682	4272	4479	5069		
	9	1470	2134							656	1319	1054	1717	1452	2116	1851	2514	2249	2913	2648	3311	3445	4108	4242	4905		
	10	1634	2371							418	1156	817	1554	1215	1953	1614	2351	2012	2750	2411	3148	3208	3945	4005	4742		
	11	1797	2608									580	1391	978	1789	1377	2188	1775	2586	2174	2985	2971	3782	3768	4579		
	12	1960	2845									343	1227	741	1626	1140	2024	1538	2423	1937	2821	2734	3618	3531	4415		
GS-350	1	245	355	2031	2142	2628	2738	3225	3335	3821	3932	4418	4528	5014	5125	5611	5721	6208	6318	6804	6915	7997	8108	9191	9301		
	2	489	710	1676	1897	2273	2494	2870	3090	3466	3687	4063	4284	4659	4880	5256	5477	5853	6073	6449	6670	7642	7863	8836	9056		
	3	734	1065	1321	1653	1918	2249	2515	2846	3111	3442	3708	4039	4304	4636	4901	5232	5498	5829	6094	6425	7287	7619	8481	8812		
	4	978	1420	967	1408	1563	2005	2160	2601	2756	3198	3353	3794	3950	4391	4546	4988	5143	5584	5739	6181	6933	7374	8126	8567		
	5	1223	1775	612	1163	1208	1760	1805	2357	2401	2953	2998	3550	3595	4146	4191	4743	4788	5340	5384	5936	6578	7129	7771	8323		
	6	1468	2130	257	919	853	1515	1450	2112	2046	2709	2643	3305	3240	3902	3836	4498	4433	5095	5029	5692	6223	6885	7416	8078		
	7	1712	2485			498	1271	1095	1867	1691	2464	2288	3061	2885	3657	3481	4254	4078	4850	4674	5447	5868	6640	7061	7833		
	8	1957	2840					740	1623	1336	2219	1933	2816	2530	3413	3126	4009	3723	4606	4319	5202	5513	6396	6706	7589		
	9	2201	3195							981	1975	1578	2571	2175	3168	2771	3765	3368	4361	3964	4958	5158	6151	6351	7344		
	10	2446	3550							627	1730	1223	2327	1820	2923	2416	3520	3013	4117	3610	4713	4803	5906	5996	7100		
	11	2691	3905									868	2082	1465	2679	2061	3275	2658	3872	3255	4469	4448	5662	5641	6855		
	12	2935	4260									513	1838	1110	2434	1706	3031	2303	3627	2900	4224	4093	5417	5286	6610		
GS-400	1	262	411	2845	2994	3659	3808	4473	4622	5287	5436	6101	6250	6915	7064	7729	7878	8543	8692	9357	9506	10985	11134	12613	12762		
	2	525	823	2433	2731	3247	3545	4061	4359	4875	5173	5689	5987	6503	6801	7317	7615	8131	8429	8945	9243	10573	10871	12201	12499		
	3	787	1234	2022	2469	2836	3283	3650	4097	4464	4911	5278	5725	6092	6539	6906	7353	7720	8167	8534	8981	10162	10609	11790	12237		
	4	1050	1646	1610	2206	2424	3020	3238	3834	4052	4648	4866	5462	5680	6276	6494	7090	7308	7904	8122	8718	9750	10346	11378	11974		
	5	1312	2057	1199	1944	2013	2758	2827	3572	3641	4386	4455	5200	5269	6014	6083	6828	6897	7642	7711	8456	9339	10084	10967	11712		
	6	1575	2469	787	1681	1601	2495	2415	3309	3229	4123	4043	4937	4857	5751	5671	6565	6485	7379	7299	8193	8927	9821	10555	11449		
	7	1837	2880	376	1419	1190	2233	2004	3047	2818	3861	3632	4675	4446	5489	5260	6303	6074	7117	6888	7931	8516	9559	10144	11187		
	8	2100	3292			778	1970	1592	2784	2406	3598	3220	4412	4034	5226	4848	6040	5662	6854	6476	7668	8104	9296	9732	10924		
	9	2362	3703					1181	2522	1995	3336	2809	4150	3623	4964	4437	5778	5251	6592	6065	7406	7693	9034	9321	10662		
	10	2625	4115					769	2260	1583	3074	2397	3888	3211	4702	4025	5516	4839	6330	5653	7144	7281	8772	8909	10400		
	11	2887	4526							1172	2811	1986	3625	2800	4439	3614	5253	4428	6067	5242	6881	6870	8509	8498	10137		
	12	3149	4938							760	2549	1574	3363	2388	4177	3202	4991	4016	5805	4830	6619	6458	8247	8086	9875		
	13	3412	5349									1163	3100	1977	3914	2791	4728	3605	5542	4419	6356	6047	7984	7675	9612		
	14	3674	5761									751	2838	1565	3652	2379	4466	3193	5280	4007	6094	5635	7722	7263	9350		
	15	3937	6172													1154	3389	1968	4203	2782	5017	3596	5831	5224	7459	6852	9087
	16	4199	6584													742	3127	1556	3941	2370	4755	3184	5569	4812	7197	6440	8825

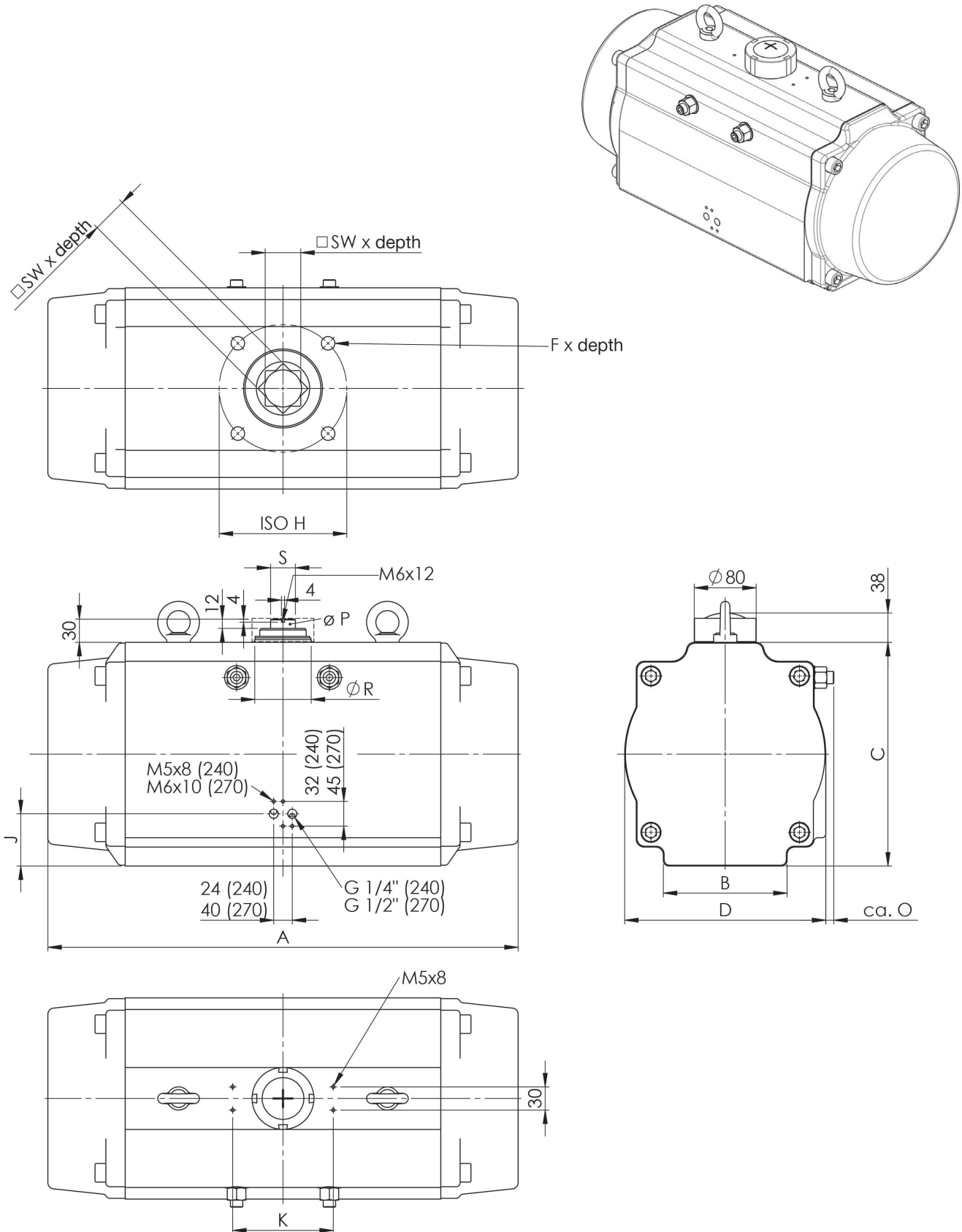
Dimensional drawings for type GD-032



Dimensional drawings for type GD-040 and GD/GS-52 to -210



Dimensional drawings for type GD/GS-240 and -270



Dimensional drawings for type GD/GS-300, -350 and -400

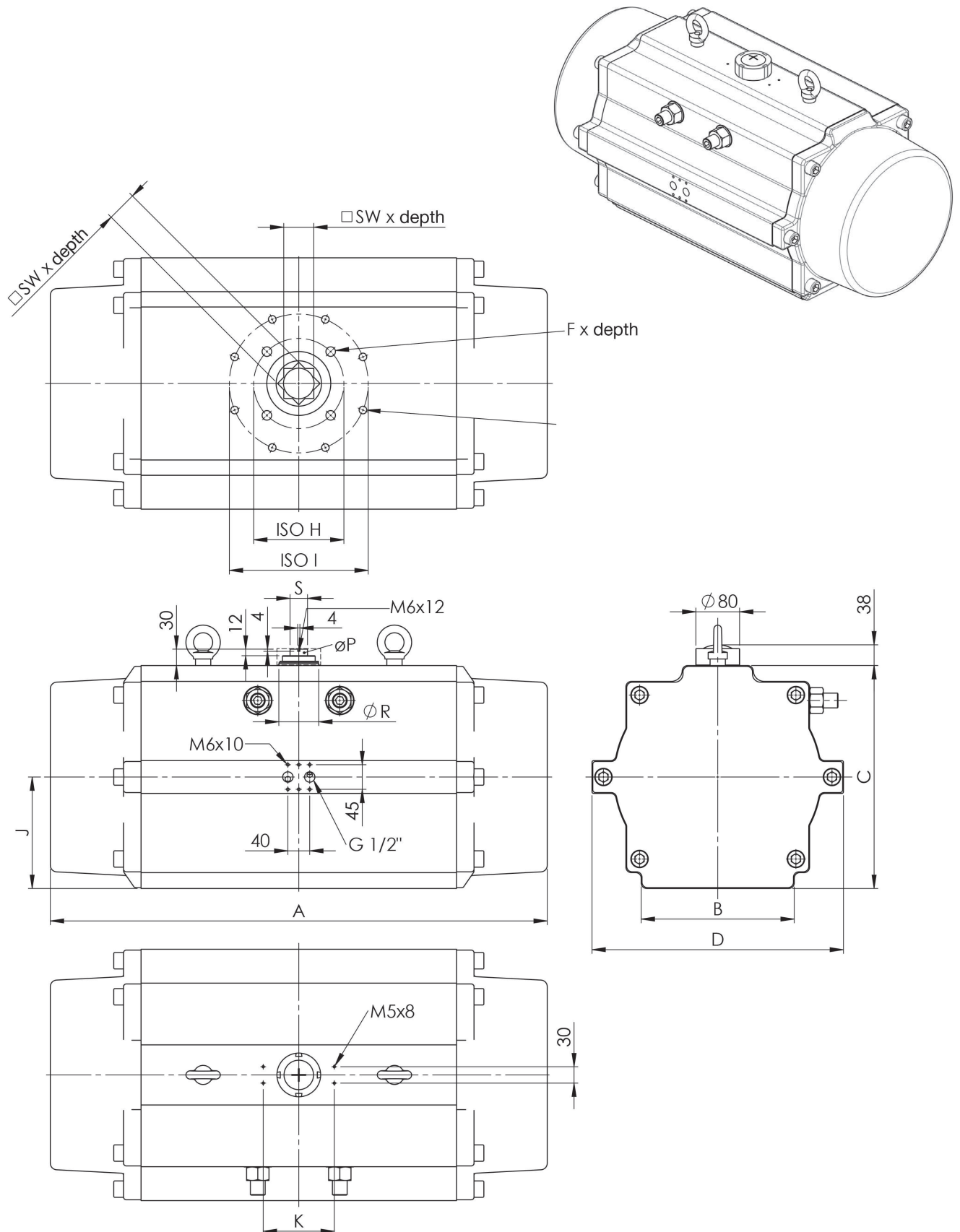


Table of dimensions

Type GD GS	A	A1	B	C	D	E	F x depth	G x depth	ISO H	ISO I	J	K	N	O	O1	P	R	S	SW x depth
032	114		55	49		1/8"	M5x8		ø36/F03		24,5	80				ø12	ø21,5	10	9x11
040	120		60,5	60		1/4"	M5x8	M6x9	ø36/F03	ø50/F05	24	80		15		ø12	ø21,5	10	11x14
052	147	210	60	72	74,5	1/4"	M5x8	M6x9	ø36/F03	ø50/F05	48	80	46	9	16	ø12	ø21,5	10	11x14
063	165	241	72	88	83	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	61	80	46	12	14	ø12	ø26,5	10	14x18
075	182	258	84	99,5	95	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	73,3	80	46	11	14	ø12	ø26,5	10	17x19
083	208	302	92	109	103	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	80	80	46	12	16	ø12	ø26,5	10	17x21
092	262	375	102	116,5	109,5	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	91	80	46	9	22	ø18	ø35	14	17x21
105	270	397	115	133	124,5	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	99,5	80	46	7,5	16	ø18	ø35	14	22x26
125	301	443	135	155	142	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	127	80	46	8,5	23	ø28	ø46	20	22x26
140	395	585	152	172		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	138	80	75	7	16	ø28	ø51	20	27x31
160	454	675	174	197		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	159,5	80	84	6	15	ø28	ø51	20	27x31
190	528	781	206	230		1/4"	M16x24		ø140/F14		188	130	100	8,5	38	ø44	ø61	32	36x40
210	536	789	226	255		1/4"	M16x24		ø140/F14		205,5	130	115	10,5	35	ø44	ø73	32	36x40
240	608		160	289	260	1/4"	M20x25		ø165/F16		67,5	130		10,5		ø44	ø73	32	46x50
270	721		160	328	294	1/2"	M20x25		ø165/F16		79	130		13,5		ø44	ø73	32	46x50
300	769		210	348	406	1/2"	M20x25		ø165/F16		174	130				ø44	ø73	32	46x60
350	909		280	408	460	1/2"	M20x25	M16x25	ø165/F16	ø254/F25	204	130				ø44	ø73	32	55x60
400	925		300	480	516	1/2"	M20x25	M16x25	ø165/F16	ø254/F25	240	130				ø44	ø73	32	55x60

Double-acting actuators

Type GD	Weight [kg]	Volume/double stroke [L]	Type GD	Weight [kg]	Volume/double stroke [L]
032	0,73	0,09	/	/	/
040	0,9	0,19	/	/	/
052	1,3	0,28	052/180	1,9	0,47
063	2,0	0,44	063/180	2,9	0,79
075	2,55	0,64	075/180	3,7	1,13
083	3,25	0,9	083/180	4,9	1,6
092	5,24	1,37	092/180	6,6	2,45
105	6,06	1,83	105/180	9,0	3,48
125	10,00	3,0	125/180	13,0	5,65
140	14,02	4,7	140/180	21,0	9,16
160	24,52	6,9	160/180	31,0	13,69
190	32,4	11,3	190/180	46,0	22,33
210	39,8	15,0	210/180	54,0	28,53
240	57,0	20,0	/	/	/
270	78,7	31,0	/	/	/
300	121,7	53,5	/	/	/
350	210,2	81,4	/	/	/
400	280	108,6	/	/	/

Single-acting actuators

Type GS	Weight* [kg]	Volume/double stroke [L]
032	/	/
040	/	/
052	1,43	0,12
063	2,17	0,21
075	2,81	0,30
083	3,67	0,43
092	6,01	0,64
105	6,9	0,95
125	11,38	1,6
140	16,42	2,5
160	28,32	3,7
190	39,4	5,9
210	49,3	7,5
240	70,0	11,0
270	100,3	17,0
300	149,12	23,8
350	259,3	35,1
400	325	52,6

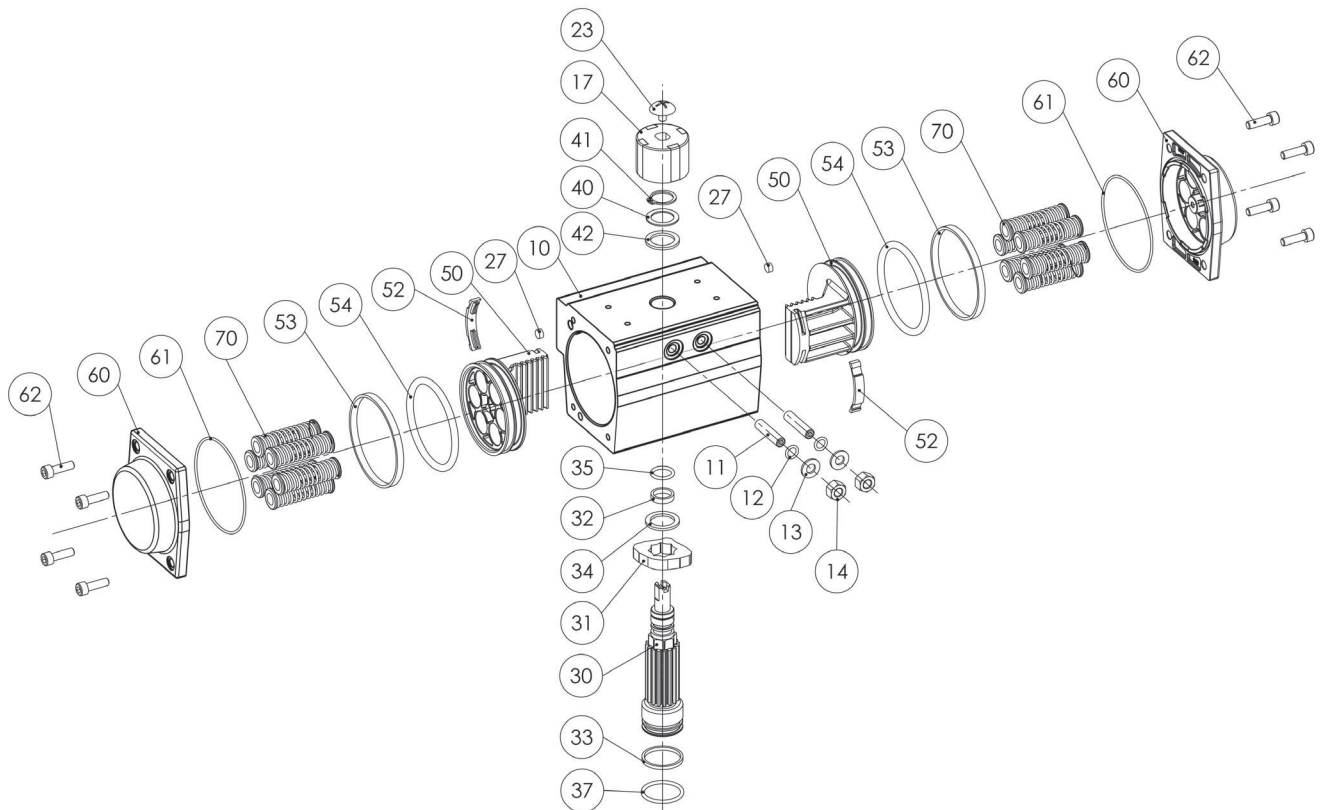
* Weight with 12 springs

Components GD-032 to -040 and GD/GS-052 to -400




10	Casing		30	Pinion				
11	Stop screw	Not applicable to size -032	31	Stop pin	Not applicable to size -032	50	Piston	
12	Seal Stop screw	Not applicable to size -032	32	Pinion bearing upper	Not applicable to size -032	52	Guiding shoe	Not applicable to size -032
13	Washer	Not applicable to size -032	33	Pinion bearing lower	Not applicable to size -032	53	Guide ring	Not applicable to -032 and -040, 2 x to size -350 and -400
14	Lock nut	Not applicable to size -032	34	Inside thrust washer		54	Piston sealing	2 x for size -400
17	Position indicator		35	Seal pinion upper		60	Cap	
23	Fixing screw for position indicator		37	Seal pinion lower		61	Cap seal	
25*	Ring nut	Size -160 to -400	40	Support washer		62	Cap screws	
26*	Plastic washer	Size -160 to -400	41	Lock washer		70	Springs	Not applicable to -032 and -040
27	Sealing plug	Not applicable to size -032	42	Outside thrust washer				

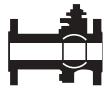



* Slings from GD/GS-160

Schematic diagram



Mounting options

2/2-way valve	Drive pinion design	Operating way	Installation variant
		Single-acting spring force "close"	F
		Single-acting spring force "open"	H
	Double-D = Z (upon request) 	Single-acting spring force "close"	A
		Single-acting spring force "open"	D

2/2-way valve	Drive pinion design	Operating way	Installation variant
 Ball valve and tap cock 		Single-acting spring force "close"	F
		Single-acting spring force "open"	H
	Double-D = Z (upon request) 	Single-acting spring force "close"	A
		Single-acting spring force "open"	D

Order code (example)

G	S	-	0	7	5	/	0	9	0	-	0	7	-	F05/07	-	V14	-	F	
G	D	-	0	7	5	/	0	9	0	-			-	F05/07	-	V14	-	F	
Operating way			Type				Pivoting angle 90°				Amount of springs		ISO flange pattern			Pinion design*		Installation variant	
GS = single-acting GD = double-acting																			

* **V** = octagon with size **Z** = Double-D with size

Pneumatic actuators

Twin-piston actuator, type ETD/ETE – 4A
stainless steel version



Product description

The stainless steel actuator is specially designed for the use in aggressive ambience, but offers at the same time the advantages of the standard line of products. Modes of application are for example in the foodstuff, beverage, pharma, chemical industry, offshore range, etc.

Technical data

Technical data	
Type	pneumatic twin-piston actuator type ETD = double-acting type ETE = single-acting (with spring return)
Construction features	tooth rack and pinion technique with self-centering piston guidance in the casing single-acting: with bar safety springs
Mounting position	any orientation
Standards	interface actuator/valve: internal thread in the casing according to DIN/ISO 5211, actuator shaft according to DIN 3337 interface actuator/control valve and actuator/signal units: VDI/VDE 3845 (NAMUR)
Materials	
Casing	stainless steel AISI 316 (1.4408)
Cap	stainless steel AISI 316 (1.4408))
Piston/racks	stainless steel AISI 316 (1.4408)
Shaft	stainless steel AISI 316 (1.4408)
Seals	NBR
Bearings	easy gliding plastic
Ambient temperatures	-20° C to +80° C
Pivoting angle	90° ± 4°
Control pressure	2 to 8 bar
Control medium	filtered air in according to DIN ISO 8573-1/Class 4
Accessories	on request

Special features

- structural dimensions of double- and singleacting actuators are the same
- limit adjustment of pivoting angle series ± 4°
- excellent capacity of resistance to wear through slide bearing of all moving parts, thereby absolutely maintenance-free
- easy, not dangerous and cost saving reconditioning through fastened bar-safety springs
- universal mounting possibilities of all signal units to normed interfaces

Ordering code

ETE-	105 / 090-	08-	V22-	F
E = single-acting D = double-acting	Pivoting angle (90°)	Number of springs, at ETD „none“	Shaft version, V = octagonal	Mounting variation (F – H)

Mounting variations

Basic position			Rotating direction	Switched position			Mounting variations
... of pistons	shaft position			... of pistons	shaft position		
	top	below	top		below		
							F
							E
							G
							H

Dimensions

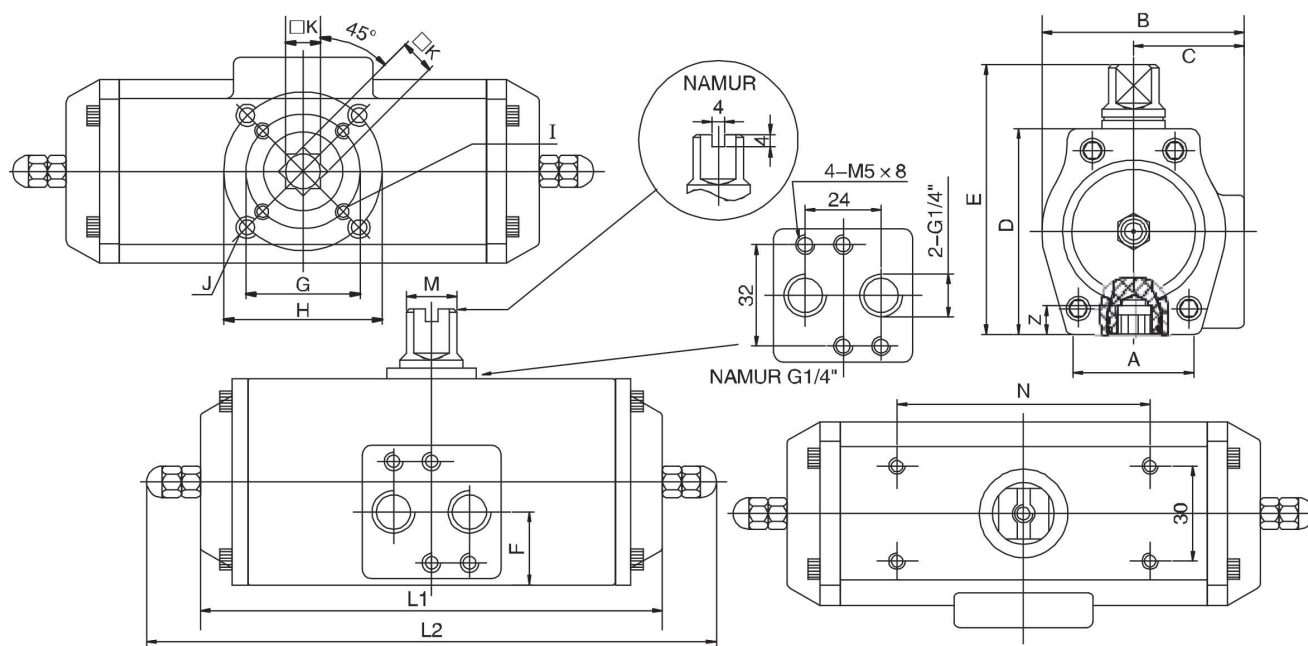


Table of dimensions

Type	A	B	C	D	E	F	G	H	I	J	K	L1	L2	M	N	Z	Weight kg	
																	ETE	ETD
ETD-045/090	42	64	35	65	95	23	ø36	ø50	M5x8	M6x10	14	148	180	16	80	14	2,65	2,51
ETD-060/090	48,5	74	39	81	111	23		ø50		M6x10	14	166	185	16	80	18	4,10	3,85
ETD-085/090	66	101	52	108	138	24	ø50	ø70	M6x10	M8x13	17	197	212	16	80	21	7,00	6,35
ETD-105/090	80	118	60	133	163	24		ø70		M8x13	17	250	269	16	80	26	12,60	11,90
ETD-125/090	100	138	69	155	185	28	ø70	ø102	M8x13	M10x16	22	286	306	22	130	26	19,20	18,00
ETD-140/090	115	153	77	171	201	34	ø102	ø125	M10x16	M12x20	27	364	376	22	130	31	27,30	24,80
ETD-160/090	132	175	87	197	227	39	ø102	ø125	M10x16	M12x20	27	412	432	22	130	31	37,60	35,80

Torques of double-acting actuators, type ETD [Nm]

Actuator type	Control pressure P _{st} (bar)		
	4,0	5,5	6,0
ETD-045/090	12	16,5	18
ETD-060/090	28,5	39	42,5
ETD-085/090	61	85	92
ETD-105/090	131	181	197
ETD-125/090	205	282	308
ETD-140/090	351	482	526
ETD-160/090	535	735	802

Torques of single-acting actuators, type ETE [Nm]

Actuator type	Number of springs	Spring force Md [Nm] min. max.		Control pressure P _{st} (bar)					
				4,0 min. max.		5,5 min. max.		6,0 min. max.	
ETE-045/090	-08	4,6	7,4	4,3	7,2	-	-	-	-
	-10	5,8	9,2	2,4	6,0	6,9	10,5	8,4	12,0
	-12	7,0	11,1	-	-	5,0	9,3	6,5	10,8
ETE-060/090	-08	10,9	16,7	10,8	16,9	-	-	-	-
	-10	13,7	20,9	6,4	14,0	17,0	24,6	20,6	28,2
	-12	16,4	25,0	-	-	12,6	21,7	16,2	25,3
ETE-085/090	-08	25,3	36,8	22,8	35,0	-	-	-	-
	-10	31,6	46,0	13,2	28,3	36,4	51,5	44,1	59,2
	-12	38,0	55,2	-	-	26,7	44,8	34,4	52,2
ETE-105/090	-08	51	79	49	78	-	-	-	-
	-10	63	98	28	65	77	114	94	131
	-12	76	118	-	-	57	101	73	117
ETE-125/090	-08	84	125	73	117	-	-	-	-
	-10	105	157	40	95	117	172	143	198
	-12	126	188	-	-	84	150	110	176
ETE-140/090	-08	137	206	134	207	-	-	-	-
	-10	172	258	80	170	211	302	255	345
	-12	206	310	-	-	157	266	200	309
ETE-160/090	-08	223	333	184	300	-	-	-	-
	-10	279	417	96	241	297	441	264	508
	-12	335	500	-	-	209	382	276	449

Electric actuator

Type STV



Type ER PLUS



Type ER PREMIER



Type VR



Type VS



Type VT



Type VT PLUS



Type MT

Electric actuator – type ER PREMIER

Product description

90° electric actuator, PA6 casing UL 94 V0 with secured manual override for torques of 20-35-60-100 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- standard version: 90° – MULTIVOLT: operating time from 6 s to 22 s (without load)
- FASTSTOP 10-20 Nm version 12/24 V AC/DC): operating time from 1.5 s to 6 s

Technical data

- duty rating S4 30% (IEC34)
- temperature: -10 °C to +55 °C
- enclosure: IP65
- weight: 1 kg - 2.1 kg
- casing PA6 UL 94 V-0
- manual override by shaft

Standard equipment

- multivoltage actuator:
 - 100 V to 240 V 50/60 Hz (100 V to 350 V DC)
 - 15 V to 30 V 50/60 Hz (12 V to 48 V DC)
- on-off or 3 modulating points control
- 4 adjustable limit switches 5A
- removable adaptation plates:
 - ER 20 Nm: F03-F04-F05
 - ER 35-100 Nm: F05-F07
- star drive nut
- secured manual override
- modular position indicator
- torque limiter monitored by polyswitch
- mechanical travel stops at 90°
- 1 x 3P+T DIN43650 connector + 1x ISO M20

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®

Electric actuator – type ER PLUS

Product description

90° electric actuator, PA6 casing UL 94 V-0 with secured manual override for torques of 10-20-35-60-100 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- standard version: 90° – MULTIVOLT: operating time from 6 s to 20 s (without load)
- long operating version: 90° – MULTIVOLT: operating time from 34 s to 110 s (without load)
- different possible rotation angles
- also available: FAILSAFE, POSI, 3 position and Bluetooth® versions.

Technical data

- duty rating S4 50% (IEC34)
- temperature: -10 °C to +55 °C
- enclosure: IP66
- weight: 1 kg - 2.1 kg
- casing PA6 UL 94 V-0
- manual override by shaft

Standard equipment

- multivoltage actuator:
 - 100 V to 240 V 50/60 Hz (100 V to 350 V DC)
 - 15 V to 30 V 50/60 Hz (12 V to 48 V DC)
- on-off or 3 modulating points control
- 4 adjustable limit switches 5A
- removable adaptation plates:
 - ER 10-35 Nm: F03-F04-F05
 - ER 35-100 Nm: F05-F07
- star drive nut
- secured manual override
- modular position indicator
- integrated anticondensation heater
- torque limiter monitored by software
- motor failure feedback relay (normal duty, failure)
- RS485 connection
- mechanical travel stops at 90°
- 1 3P+T DIN43650 connector + 1 ISO M20 (ISO - NPT adapters available as option)

Ordering code

STV-ER20-X0A-	G00-	90-240V AC/DC
actuator size	actuator code	actuator voltage

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®

Electric actuator – type VR

Product description

Electric actuator, aluminium casing and polyamide PA6 UL 94 V-0 or aluminium (option) cover with manual override by external shaft, for torques from 25 to 75 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- 90° standard version
- version for marine applications, high durability coating, 15-year warranty

Technical data

- duty rating: S4 50% (CEI34)
- working temperature: -20 °C to +70 °C
- enclosure: IP68 2 m / 72 h
- weight: 3.1 kg - 4.4 kg
- aluminium casing and cap of polyamide PA6 UL 94 V-0 or aluminium (optional)
- manual override by shaft

Standard equipment

- multivoltage actuator:
 - 100 V to 240 V 50/60 Hz (100 V to 350 V DC)
 - 15 V to 30 V 50/60 Hz (12 V to 48 V DC)
- 3-phase 50/60 Hz 400 V (not CSA)
- 3 modulating points control or on-off (400 V : 3 modulating points control)
- 4 adjustable limit switches 5A
- connection F05/F07 according to ISO5211 standard
- removable star drive
- manual override
- visual position indicator
- regulated anticondensation heater
- torque limiter monitored by software (except 400 V)
- failure feedback relay (normal duty, failure) (except 400 V)
- RS485 connection (except 400 V)
- mechanical limit stops
- 2 x ISO M20 (ISO - NPT adapters available as option)

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®
- 180° oder 270° versions on request

Electric actuator – type VS

Product description

Electric actuator, aluminium casing and polyamide PA6 UL 94 V-0 or aluminium (option) cover with manual override by hand wheel, for torques from 100 to 300 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- 90° standard version
- version for marine applications, high durability coating, 15-year warranty

Technical data

- Duty rating: S4 50% (CEI34)
- Working temperature: -20 °C to +70 °C
- Enclosure IP68:
 - 2 m / 72 h (plastic cover)
 - 5 m / 72 h (aluminium cover)
- Weight: 3.1 kg to 4.4 kg
- aluminium casing and cap of polyamide PA6 UL 94 V-0 or aluminium (optional)
- manual override by hand wheel

Standard equipment

- multivoltage actuator:
 - 100 V to 240 V 50/60 Hz (100 V to 350 V DC)
 - 15 V to 30 V 50/60 Hz (12 V to 48 V DC)
- 3-phase 50/60 Hz 400 V (not CSA)
- 3 modulating points control or on-off (400 V : 3 modulating points control)
- 4 adjustable limit switches 5A
- connection F07/F10 according to ISO5211 standard
- removable star drive
- manual override
- visual position indicator
- regulated anticondensation heater
- torque limiter monitored by software (except 400 V)
- failure feedback relay (normal duty, failure) (except 400 V)
- RS485 connection (except 400 V)
- mechanical limit stops
- 2 ISO M20 (ISO - NPT adapters available as option)

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®
- 180° oder 270° versions on request

Electric actuator – type VT

Product description

Electric actuator, aluminium casing and polyamide PA6 UL 94 V-0 or aluminium cover (option) with manual override by hand wheel, for torques from 600 to 240 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- 90° standard version
- version for marine applications, high durability coating, 15-year warranty

Technical data

- duty rating: S4 50% (IEC34)
- working temperature: -20 °C to +70 °C
- enclosure IP68:
 - 2 m / 72 h (plastic cover)
 - 5 m / 72 h (aluminium cover)
- weight: 24 kg (600-1000 Nm) and 53 kg (1500-2400 Nm)
- aluminium casing and cap of polyamide PA6 UL 94 V-0 or aluminium (optional)
- manual override by hand wheel

Standard equipment

- 230 V 50/60 Hz or 3-phase 50 Hz 400 V actuator
- 3 modulating points control
- 4 adjustable limit switches 5A
- connection according to ISO5211 standard:
 - VT600-1000 Nm: F10/F12
 - VT1500-2400 Nm: F12/F14/F16
- removable star drive
- manual override
- regulated anticondensation heater
- mechanical torque limiter
- failure feedback relay (normal duty, failure)
- visual position indicator
- adjustable mechanical limit stops
- 2 x ISO M20

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®
- 180° oder 270° versions on request

Electric actuator – type VT PLUS

Product description

Electric actuator, aluminium casing and polyamide PA6 UL 94 V-0 or aluminium cover (option) with manual override by hand wheel, for torques from 600 to 240 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- 90° standard version
- 180° or 270° versions (600 and 1000 Nm on request)

Technical data

- duty rating: S4 50% (IEC34)
- working temperature: -20 °C to +70 °C
- enclosure IP68:
 - 2 m / 72 h (plastic cover)
 - 5 m / 72 h (aluminium cover)
- weight: 24 kg (600-1000 Nm) and 53 kg (1500-2400 Nm)
- aluminium casing
- manual override by hand wheel

Standard equipment

- 230 V 50/60 Hz or 3-phase 50 Hz 400 V actuator
- 3 modulating points control
- 4 adjustable limit switches 5A
- connection according to ISO5211 standard:
 - VT600-1000 Nm: F10/F12
 - VT1500-2400 Nm: F12/F14/F16
- removable star drive
- manual override
- regulated anticondensation heater
- mechanical torque limiter
- failure feedback relay (normal duty, failure)
- visual position indicator
- adjustable mechanical limit stops
- 2 x ISO M20

Special features

- Failsafe version
- Positioner version
- ATEX version
- Marine version
- 3 Position version
- AXMART Bluetooth®
- version for marine applications, high durability coating, 15-year warranty

Electric actuator – type MT

Product description

Multiturn electric actuator, aluminium casing with manual override by hand wheel, for torques from 25 to 75 Nm and in accordance with CE-ROHS-REACH directives.



Versions

- aluminium casing and emergency actuation

Technical data

- duty rating: S4 50% (CEI34)
- working temperature: -20 °C to +70 °C
- enclosure IP68 5 m / 72 h
- weight: 19 kg - 23 kg
- aluminium casing
- manual override by hand wheel

Standard equipment

- multivoltage actuator:
 - 100 V to 240 V 50/60 Hz (100 V to 300 V DC)
 - 24 V to 48 V 50/60 Hz (24 V to 72 V DC)
- on-off, pulse and 3 modulating points control
- integrated 4-20 mA or 0-10 V positioning solution with feedback signal
- integrated Bluetooth® control (AXMART®)
- RS485 connexion
- 4 adjustable limit switches 5A
- connection according to ISO5210 standard:
 - A (with drive bush): ø 25 mm max
 - B1 (with drive bush): ø 42 mm max
 - B3: ø 20 mm max
 - C: ø 43 mm max
- manual override
- electronic torque limiter
- failure feedback relay (normal duty, failure)
- visual position indicator
- regulated anticondensation heater
- single multipin connector

Special features

- Failsafe version
- Positioner version
- ATEX version
- version for marine applications, high durability coating, 15-year warranty
- 3 Position version
- AXMART Bluetooth®

Chapter 4

Signal units

Positioner and
limit switch boxes



bar-positrol®



bar-positurn2



bar-positswitch



bar-valve&switch



bar-posifixx-A



bar-posifixx-S



bar-PCS



bar-ICS



bar-switchcontrol



bar-miniswitch®



bar-SWITCHmaster®



bar-illuminate

bar-positrol®

A module of the system bar-vacotrol

Positioner and 3-position control unit with
direct pneumatic interface to part-turn actuator actubar®



Product description

Electro-pneumatic positioner for pneumatic quarter-turn actuators which is extraordinary by its easy handling and installation as well as his wide-ranged functions. Automatic initialising, end position indication and analogue position indication is standard. By a switch there is a choice between or current mode or voltage mode and the 3-point-position can be activated.

In combination with the quarter-turn actuator actubar there is no need for tubing or pressure hoses. By direct assembling there is only need for the electric connection and the supply with pneumatic air which will be pressed directly into the actuator chambers onto the actuator top side. Therefore the assembling is easy done and there are no potential leakages. Assembling as per VDI VDE 3845 is possible also.

Technical data

Technical data	
Materials	casing: GD -AlSi 10Mg (Aluminium press-cast) screws: A2-70 (stainless steel) viewing Glass: PMMA optic fibre: TPE cable connection: PA
Pivoting angle	0° to 180°
Protection type	IP67
Mounting position	any orientation
Ambient temperature	-10 °C to +50 °C
Ambient humidity	10 – 90%, non-condensing
Analog control signal Actuating signal	effective direction: reversible by sliding switch signal type: selectable 0–20 mA, 2–10 V, inverse polarity protection, proportional to pivoting angle pre-resistor: > 1 kOhm at 10 V; < 500 Ohm at 20mA
Dead-zone	± 2% of nominal pivoting angle
Position signal	signal type: selectable 4–20 mA, 0–10 V, nominal, active, inverse polarity protection, proportional pivoting angle resolution: < 0,5% of nominal pivoting angle
Limit feedback	voltage: 24 VDC indication: 3 % of nominal pivoting angle before initiated end position
Supply	24 VDC (21 to 28 VDC), inverse polarity protection
Terminal strip	clamping range up to 0,75 mm ²
Cable to PCS	7 to 13 mm, 0,5 mm ²
Operating pressure	3 to 8 bar
Air connection	G 1/8"
Air quality	filtered air acc. to DIN ISO 8573-1:2010 [7: – :4], pressure dew point min. 10° C below temperature of pneumatic air
Flow rate	approx. 280 l/min
Safety function	depending on the type: fail to stay / fail to close / fail to open

Product features

- direct and compact assembling onto actubar
- integrated end position sensing
- analogue position indication
- optical position indication
- safe fail function in case of energy loss
- 3-point positioner
- direct pneumatic interface to actubar
- air recirculation of spring chambers possible
- manual override

Product features

- higher flow rate
- reduced dead zone

bar-positurn2

A module of the valve-control system bar-vacotrol

Positioner and 3-position control unit for part-turn actuators



Objective

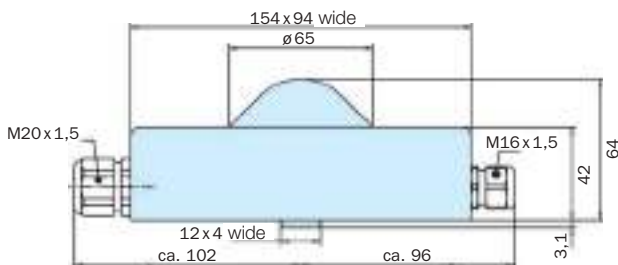
bar-positurn2 is an electro-pneumatic positioner and simultaneously a 3-position control unit specially designed for pneumatic part-turn actuators. It is an economical and robust modular component of the Valve-Control-System, known as bar-vacotrol. bar-positurn2 can be mounted onto all actuators of the actubar-series as well as onto all actuators with NAMUR interface according to VDI/VDE 3845.

Deployment range

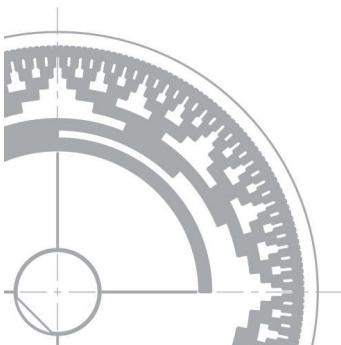
Typical applications for bar-positurn2 are:

- butterfly valves, ball-valves and plug-valves with a regulating function such as deployed in filter technology and water treatment plants as well as in general industrial applications.
- flue-gas dampers, which usually find use in combustion plant or exhaust gas systems
- ventilation dampers in air-conditioning and similar applications
- dosing valves which are required for bulk material handling
- 3-way valves with three switching positions in general industrial applications

Measures



Function

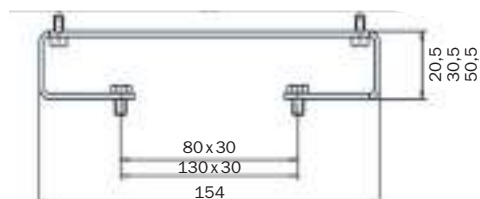


Optical rotation-angle measurement system

bar-positurn2 is a 3-point positioner in 4-wire technology. The voltage supply is 24 V DC. Position regulation takes place – depending on safety requirements – via special control valves, which are mounted onto the NAMUR interface. Pivoting angle is measured by a digital opto-electronic position sensor. The set point value is specified as an analog signal. The processor compares set point and actual values and drives the solenoid valve. In the steady state condition, the actuator is blocked pneumatically.

Momentary operating mode of bar-positurn2 is indicated by reading-off the easy-to-read four LED's on the cover. The valve position is recognisable through the visual indicator dome.

Assembly via mounting bracket



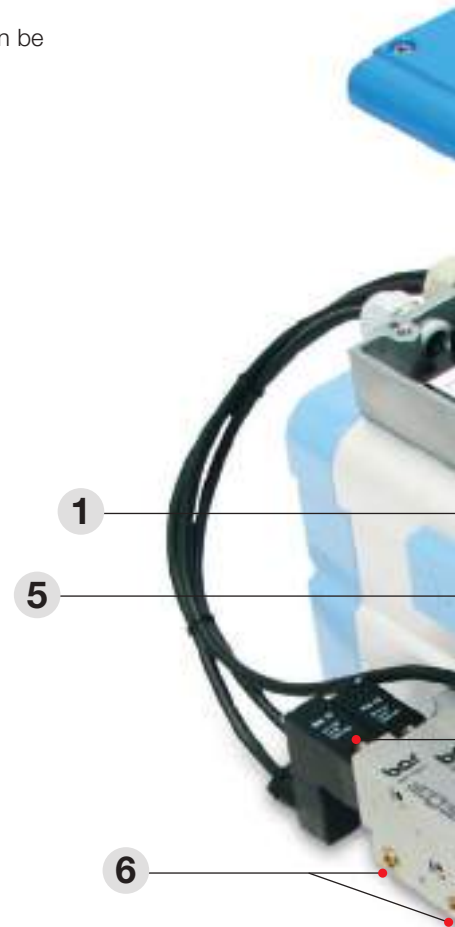
Further measures result from the according pneumatic module.

Technical data

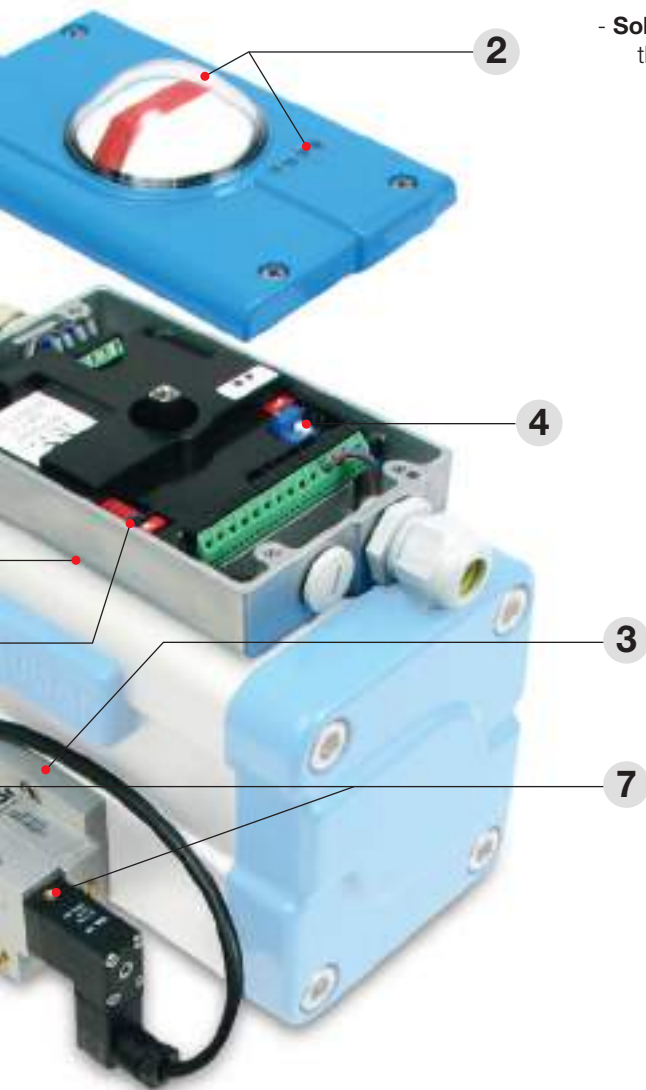
Technical data	
Materials	casing: GD-AISI 10Mg (aluminium press-cast) screws: A2-70 (stainless steel) viewing: Glass PMMA optic fibre: TPE cable connection: PA
Pivoting angle	0° bis 180°
Protection type	IP 65
Mounting position	any orientation
Ambient temperature	-20 °C to +70 °C
Ambient humidity	10 – 90%, non-condensing
Weight	without valve ca. 0,65 kg variant D: mini-valves: ca.1,0 kg / midi-valves: ca. 1,1 kg variant S: mini-valves: ca.1,2 kg / midi-valves: ca. 1,4 kg variant E: mini-valves: ca.1,2 kg / midi-valves: ca. 1,4 kg
Analog control signal Actuating signal	effective direction: reversible by sliding switch signal type: selectable 4–20 mA, 0–10 V, inverse polarity protection, proportional to pivoting angle pre-resistor: > 1 kOhm at 0–10 V; < 500 Ohm at 20 mA
Dead-zone	± 2% of nominal pivoting angle
Travel speed	adjustable by throttles in solenoid valves
Position signal	signal type: selectable 4–20 mA, 0–10 V, nominal, active, inverse polarity protection, proportional pivoting angle resolution: < 0,5% of nominal pivoting angle
Limit feedback	voltage: 22–24 VDC system: Opto-coupler, short-circuit-proof; 1 kOhm series & 10 kOhm parallel resistance fitted indication: 3% of nominal pivoting angle before initiated end position
Supply	24 VDC (21 to 28 VDC), inverse polarity protection
Power consumption	variant D: mini-valves: 1,8 W / midi-valves: 4,2 W variant S: mini-valves: 3,6 W / midi-valves: 7,2 W variant E: mini-valves: 3,6 W / midi-valves: 7,2 W
Terminal strip	clamping range up to 0,75 mm ²
Cable to PCS	7 to 13 mm, 0,5 mm ²
Binary input signals	ON/OFF valves / < 10 V for „0“; / > 18 V for „1“
Operating pressure	2,5 to 8 bar
Air quality	filtered air acc. to DIN ISO 8573-1:2010 [7: – :4]

Advantages

- 1 **Direct mounting** – **bar-positurn2** is distinguishable firstly through its flat construction and secondly because it can be directly mounted onto the pneumatic actuator actubar®. This arrangement leads to the most compact form of layout for a positioner onto a pneumatic actuator. The direct interface greatly improves the cleaning of components, as there is no space where dirt and dust can collect. The danger of injury to persons is reduced, because there are no more openly rotating connecting shafts.
- 2 **Visual position indication with indicator and LED** – The easily-visible position indicator enables continuous visual control of the valve condition. Operational readiness end positions and even intermediate positions in 3-position-mode are additionally signalised per LED displays.
- 3 **Direct solenoid valve assembly** – Through the assembly of the solenoid valve onto the actuator itself, there is no need anymore for complex compressed air hoses or pipework. Switching of the control medium directly at the actuator avoids additional volumes of air. This hereby increases the control characteristics and the decrease in junctions reduces the risk of leaks.
- 4 **Mode selection (Posi or 3-position) by means of selector switch** – **bar-positurn2** combines positioning and 3-position mode in one device. Using an integrated selector switch, it is possible to easily interchange between both modes. 3-position function enables the user to drive a standard 2-position actuator to an additional user-configurable intermediate position. Here, there is no need for generating a complicated analogue signal but just a binary 24V signal.
- 5 **Selectable signal type (4-20mA or 0-10V)** – The type of analog input and output signal can be selected and adapted to 4-20mA or 0-10V with the use of a selector switch.
- 6 **Integrated speed regulation** – Pivoting speed of the valve can be regulated through integrated thru-flow throttles. Opening and closing speeds can be adjusted independently.
- 7 **Simple on-site operation in case of voltage/signal loss** – Knobs for manual operation fitted to the pneumatic module enable comfortable on-site operation in case of voltage/signal loss.



- **Assembly to all actuators with interfaces according to VDI/VDE 3845 (NAMUR)** – Many advantages of **bar-positurn2** are applicable to pneumatic actuators from other manufacturers by using the according adaptation bracket. The bracket is supplied ready mounted.
- **Easy to mount** – Mounting **bar-positurn2** takes place with only 6 screws. All necessary material for mounting onto the actuator comes ready supplied. Time-consuming hosing or pipework as well as additional components for fixing are no longer required.
- **Pivoting angle 0° to 180°** – With the generous pivoting angle, **bar-positurn2** in its standard version already covers almost all applications, without having to supplement with additional options.
- **Output signals open/closed as well as position feedback fitted as standard** – Signals for open/closed indication as well as analog position signal are integrated into the device. No additional optional modules are required.
- **Three safety variations** – The flexibility of the pneumatic module enables that all safety-related variations can be realized:
 - Single-acting
 - Double-acting normally open / normally closed
 - Double-acting fail to stay
- **Simple parameterization** – Parameterization is very simple and can be carried out within few steps. The process needs less than one minute. The positioner learns all technical values during parameterization and is then immediately ready for operation.



- **Solenoid valve flow rate adapted to the actuator volume** – By simply exchanging the pneumatic subassembly, it is possible to generate various flow rates. Thus, regulating characteristic and actuating speed are adapted to the actuator volume.
- **No air consumption in steady state condition** – A special construction of the pneumatic subassembly means that the **bar-positurn2** does not consume any control medium in steady state condition. The valve remains locked in position as a result of the enclosed compressed air in the actuator chambers.
- **Wear-free optical measurement of rotation angle** – The integrated optical rotation angle measurement functions without physical contact rendering it absolutely wear-free.

Ordering code

PN2-	XX-	X-	X-	X-	X
Model PN2 = positurn2	Special models: 3P = delivery condition: 3-position- controller	Valve-funktion D = double- acting (fail to stay in case of voltage- or signal-failure) S = double- acting (fail to close/open in case of voltage- or signal-failure) E = single- acting (fail to close/open in case of volta- ge-, signal- or pneumatic- failure)	Valve-version S = valve-version for actuator sizes AD/AS-004 up to AD/AS-076 GD-032 to GD/GS-125 (for air volume up to ~ 5 l per double-stroke) M = valve-version for actuator sizes AD/AS-110 up to AD/AS-800 GD/GS-140 to GD/GS-400 from GD/GS-270 with adapter plate 1/2" (for air volu- me from 5 l per double-stroke)	0 = none 1 = mounting bracket 80 x 30 x 30 mm 2 = mounting bracket 130 x 30 x 30 mm 5 = universal mounting bracket	Hole pattern in control-box 0 = none (assembly via mounting bracket) 3 = actubar- direct-mounting (size AD/AS-110 to AD/AS-800 GD/GS-190 to GD/GS-400) 4 = actubar- direct-mounting (size AD/AS-004 to AD/AS-008 GD-032 bis GD/GS-160)

Examples of use

PN2-	D-	S-	1-	0	
	double-acting (fail to stay)	valve-version with low flowrate (small actuators)	mounting bracket 80 x 30 x 30 mm	no hole pattern (assembly via mounting bracket)	
PN2-	S-	M-	0-	3	
	double-acting (fail to close/open)	valve-version with medium flowrate (medium sized actuators)	no mounting bracket	actubar-direct-mounting (from size AD/AS-011 to -800 or GD/GS-190 to -400)	
PN2-	3P-	E-	S-	2-	0
	3-position-controller	single-acting	valve-version with low flowrate (small actuators)	mounting bracket 80 x 30 x 30 mm	no hole pattern (assembly via mounting bracket)

bar-**posiswitch**

A module of the valve-control system bar-vacotrol

The self-adjusting opto-electric position indicator system



Objective

The new opto-electric position indicator system bar-positswitch was specially developed for the actubar type of actuator.

It can be placed directly onto the actubar – without brackets or feet – and therefore forms a compact unit.

Alternatively the bar-positswitch can be mounted on all quarter-turn-actuators with NAMUR interface acc. to VDI/VDE 3845 so that the unique advantages are usable at these combinations also.

One of the special features: the system adjusts the end positions itself!

The adjustment which is often resulting in mistakes and waste of time is not necessary any more. The position indicator system is ready for use directly after mounting. bar-positurn has all features for wiring the solenoid valves for use for monostabile as well for bistabile valves. The expensive laying of different cables per valve each is avoided as bar-positswitch offers all input and output signals and needs only one cable at all.



Technical data

Technical data		
Materials	casing: screws: sight glass: cable glands: actuating shaft:	alu-diecast, resin-coated stainless steel A2 PC PA stainless steel
Pivoting angle	to 180°	
Protection type	IP 65	
Temperature range	-10 °C to +50 °C	
Weight	520 g	
Cable glands	up to 4 glands 3 x M 16, 1 x M 20	
Cable	M 16 = ø 5 - 10 mm, up to 1,5 mm ² M 20 = ø 7 - 13 mm, up to 1,5 mm ²	
Display/switch range	0° up to 180° pivoting angle	
Micro-switch	voltage/cont. current: contacts: switch function:	type M2 DC up to 120 Volt/4A AC up to 250 Volt/16A Silver/Nickel-coated Change-over contacts
Inductive sensor	voltage range: continuous current: switch function:	type D2 , direct switching, 3-wire technology 10 V – 36 V/DC 200 mA PNP normally open

Special features

Description	Benefits
Up to 4 cable glands.	Simple, also subsequent wiring of solenoid valves in bar-positwitch is possible. Also for bistable versions with 2 coils.
Available in 2 different types of switch.	Multiple application possibilities and short delivery time via modular construction.
Adjusting switch points for both end positions.	Time and cost savings. Switching points are always correctly adjusted.
Protected and clearly visible position indicator, adjustable for 2-way- and 3-way-valves.	Path of flow is recognisable from long distances for both 2-way as well as 3-way valves.
Robust construction via Aluminium diecast-casing.	Unaffected by outside influences.
Flexible modular design.	Especially advantageous price/-performance ratio.
All components are made from either corrosion-resistant or corrosion-protected materials.	Can be adopted for many conditions.
Optionally with pressure-balance device to avoid emergence of condensation water at extrem climatic conditions	Extended life cycle of the electric components as well as higher corrosion resistance.
Direct assembly via vacotrol-interface of the quarterturn actuator actubar. Alternatively applicable for all interfaces according to VDI/VDE 3845.	Compactness and robustness due to direct mounting as well as flexible assembly to all common actuator-series



No adjusting of the end positions!

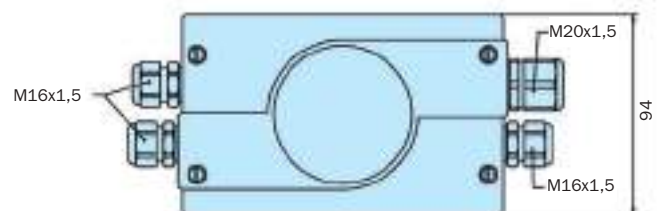
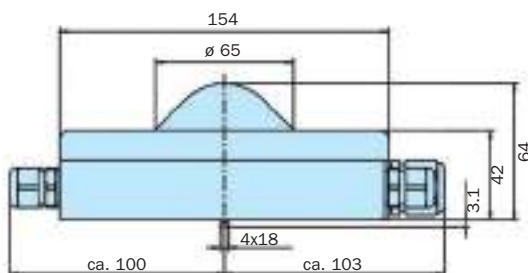


bar-positwitch is mounted directly on top of the actubar

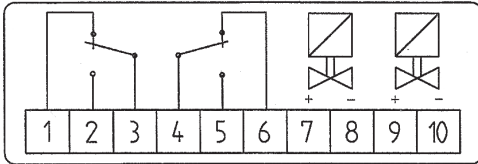


Paths of flow of the valve are clearly displayed with the red markings

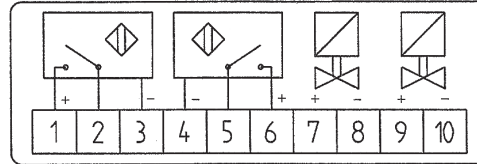
Dimensions



Switch diagrams



Micro-switch type M2



Inductive sensors type D2

Ordering code

PH-	XX-	X-	X-	XX-	XXX
	Version M2 = 2 mechanical change-over switches D2 = 2 proximity sensors, 3-wire, PNP normally open	Mounting brackets 0 = none 1 = mounting bracket 80 x 30 x 30 mm 2 = mounting bracket 130 x 30 x 30 mm 5 = universal mounting bracket	Hole pattern in box-bottom 0 = none (assembly via mounting bracket) 1 = 80 x 30 mm 2 = 130 x 30 mm	integrated solenoid-control S1 = integrated solenoid-control for 1 coil (monostabile control-valve) S2 = integrated solenoid-control for 2 coils (bistabile control-valve)	Pressure balance device DAE DAE = pressure balance device DAE avoiding internal condensation

Examples of use

PH-	M2-	1-	0-
	2 change-over switches	assembly via mounting bracket 80 x 30 x 30 mm	no hole pattern in box-bottom (assembly via mounting bracket)

PH-	D2-	0-	1-	S1
	2 proximity sensors, 3-wire, PNP NO	no mounting bracket	hole pattern in box-bottom: 80 x 30 mm	integrated solenoid-control for 1 coil (monostabile)

PH-	M2-	0-	2-	S2-	DAE
	2 change-over switches	no mounting bracket	hole pattern in box-bottom: 130 x 30 mm	integrated solenoid-control for 2 coils (bistabile)	Integrated pressure balance device DAE avoiding internal condensation

PH-	D2-	2-	0-	DAE
	2 proximity sensors, 3-wire, PNP NO	assembly via mounting bracket 130 x 30 x 30 mm	no hole pattern in box-bottom (assembly via mounting bracket)	Integrated pressure balance device DAE avoiding internal condensation

bar-valve&switch

A module of the system bar-vacotrol

Position indicator with integrated solenoid valves for pneumatic actuators



Product description

The position indication with integrated solenoid valves has a self-adjusting end-position monitoring. By assembling direct onto quarter-turn actuator actubar® there is only need for the electric connection and the air supply. The compressed air will be pressed directly into the actuator chambers by holes on the actuator top side. Assembling as per VDI/VDE 3845 or VDI/VDE 3847 is possible also.

Technical data

Technical data	
Materials	casing: aluminium die casting, epoxy coated screws: stainless steel A2 viewing glass: PC
Pivoting angle	up to 180°
Mounting position	any orientation
Protection type	IP67
Ambient temperature	-10 °C to +50 °C
Cable	ø 7-13 mm
Air connection	G 1/8"
Operating pressure	2 – 8 bar
Actuating medium / quality	filtered air in consideration of residual oil-, -dust and -water, content minimum as per DIN ISO 8573-1:2010 [7: – :4]
Flow rate	approx. 250 l/min
Micro switch	type M2
	voltage / continuous current DC to 120 Volt/4 A AC to 250 Volt/16 A
Contacts	silver / nickel plated
Switching function	changer
Inductive switch	type D2 , direct switching, 3-wire technology
	voltage range 10 V - 36 V/DC continuous current 200 mA switching function PNP
Inductive switch	type D2 , direct switching, 2-wire technology
	voltage range 5 V - 36 V/DC continuous current 200 mA switching function PNP/NPN – closer/opener programmable

Product features

- Direct and compact assembling onto actubar
- Self-adjusting end-position monitoring
- Optical position indication
- Adjustable throttles, accessible from outside

Special versions

- Higher flow rate
- redundant configuration of solenoid valves
- Manual override

bar-posifixx-A

A module of the system bar-vacotrol

Air guidance plates for positioner type TZID (ABB) on actuators type actubar®



Product description

The new generation of pneumatic quarter-turn actuators type actubar with its additional pneumatic interface offers the direct mounting of the positioner without additional mounting parts like consoles, tubing or VA-hose system. The interoperable ABB positioner type TZID is electronically parametrisable and able to communicate.

Therefore this positioner is an ideal addition and can be adapted for manifold control functions in a compact and cost-effective way. The connection of actuator and positioner is built by adapter plates in direct mounting which are used for the airflow.

Technical data of the pneumatic quarter-turn actuator actubar®

- control pressure, depending on positioner, 2–7 bar
- end position limit adjustable at +5° to -10° in both end positions
- pneumatic double or single acting

Comprehensive information see brochure actubar®.

Technical data of the positioner TZID-C

- pressure range: 1,4 bar to 6 bar
- air performance
 - 5,0 kg/h at 1,4 bar
 - 13,0 kg/h at 6 bar
- air consumption max. 0,03 kg/h independent from supply air
- protection class IP65 (optional IP66)
- electric cable connection ½-14NPT or M20x1,5
- pneumatic connection ¼-18NPT or G 1/4"
- instrument air acc. DIN/ISO8573-1, Class 3
- SIL2-conformity for single-acting types with venting pneumatic
- ATEX Ex ia/ib
- EAC, FM and CSA, more on request
- 2-wire-connection
- significance of the position signal reversible
- pivoting angle range till 120°
- adjustable operating-time range 0–200 s
- integrated operating-time monitoring

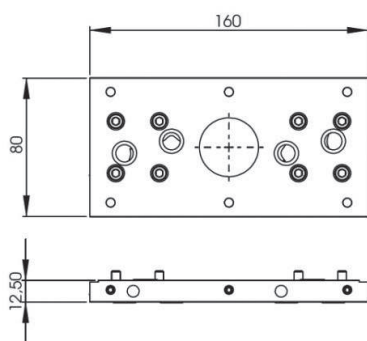
Technical data

Technical data	
Construction type	direct mounted with internal air conduction
Connection	bar-vacotrol connection
Pressure range	depending on positioner, up to 6 bar
Nominal diameter	ø 5 mm
Temperature range	-20 °C to +80 °C, other temperature range on request
Materials	plates: aluminium balls: stainless steel threaded pins: galvanized steel seals: NBR
Delivery	ground plate, adapter plate, shaft adapter, assembling material
Special features	for maintenance work the positioner can be disassembled fast and easy by quick lock. In case of signal failure a safety position is selectable by ventilation of channel 2 or channel 4.

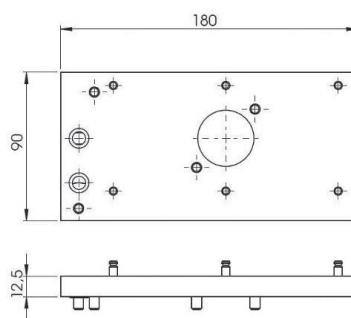
Table of dimensions – adapter plate

Operation mode	A	B	C	D	E	F
Double-acting	180	90	12,5	-	-	-
Single-acting	160	80	12,5	-	-	-

Dimensions



Ground plate



Adapter plate



Ordering code

PF	A-	D
Denomination bar-posifixx	Positioner ABB type TZID	Operation mode: D = double-acting / S = single-acting

bar-posifixx-S

A module of the system bar-vacotrol

Air guidance plates for positioner type SIPART PS2 (SIEMENS) on actuators type actubar®



Product description

The new generation of pneumatic quarter-turn actuators type actubar with its additional pneumatic interface offers the direct mounting of the positioner without additional mounting parts like consoles, tubing or VAhose system. The interoperable SIEMENS positioner type SIPART PS2 is electronically parametrisable and able to communicate. Therefore this positioner is an ideal addition and can be adapted for manifold control functions in a compact and cost-effective way. The connection of actuator and positioner is built by adapter plates in direct mounting which are used for the airflow.

Technical data of the pneumatic quarter-turn actuator actubar®

- control pressure, depending on positioner, 2–7 bar
- end position limit adjustable at +5° to -10° in both end positions
- pneumatic double or single acting

Comprehensive information see brochure actubar®.

Technical data of the positioner Sipart PS2

- pressure range: 1,4 bar to 7 bar
- air performance incoming air: - 4,1 kg/h at 2 bar
- 9,8 kg/h at 6 bar
- air performance exhaust air: - 8,2 kg/h at 2 bar
- 19,2 kg/h at 6 bar
- air consumption max. 36 g/h
- protection class IP66
- electric cable connection ½-14NPT or M20x1,5
- pneumatic connection ¼-18NPT or G 1/4"
- instrument airt acc. DIN/ISO8573-1, Class 2
- SIL2-conformity for single-acting type with venting pneumatic
- ATEX Ex ia/ib
- EAC, FM, CSA, more on request
- 2-wire-connection
- significance of the position signal reversible
- pivoting angle range till 100°
- by thread adjustable operating-time range
- integrated operating-time monitoring

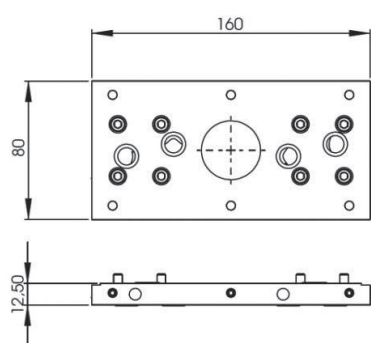
Technical data

Technical data	
Construction type	direct mounted with internal air conduction
Connection	bar-vacotrol connection
Pressure range	depending on positioner, up to 7 bar
Nominal diameter	ø 5 mm
Temperature range	-20 °C to +80 °C, other temperature range on request
Materials	plates: aluminium balls: stainless steel threaded pins: galvanized steel seals: NBR
Delivery	ground plate, adapter plate, shaft adapter, assembling material
Special features	for maintenance work the positioner can be disassembled fast and easy by quick lock. In case of signal failure a safety position is selectable by ventilation of channel 2 or channel 4.

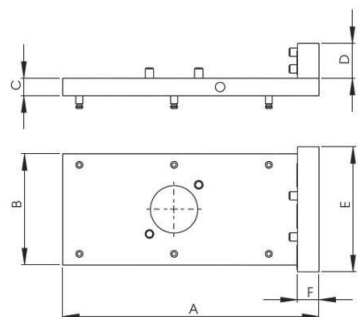
Table of dimensions – adapter plate

Operation mode	A	B	C	D	E	F
Double-acting	184	80	12,5	25	90	15,5
Single-acting	160	80	12,5	-	-	-

Dimensions



Ground plate



Adapter plate



Ordering code

PF	S-	D
Denomination bar-posifixx	Positioner SIEMENS type SIPART PS2	Operation mode: D = double-acting / S = single-acting

bar-PCS

A module from the system bar-vacotrol

Automatic air-main charging and pressure control system for compressed air supplies



Product description

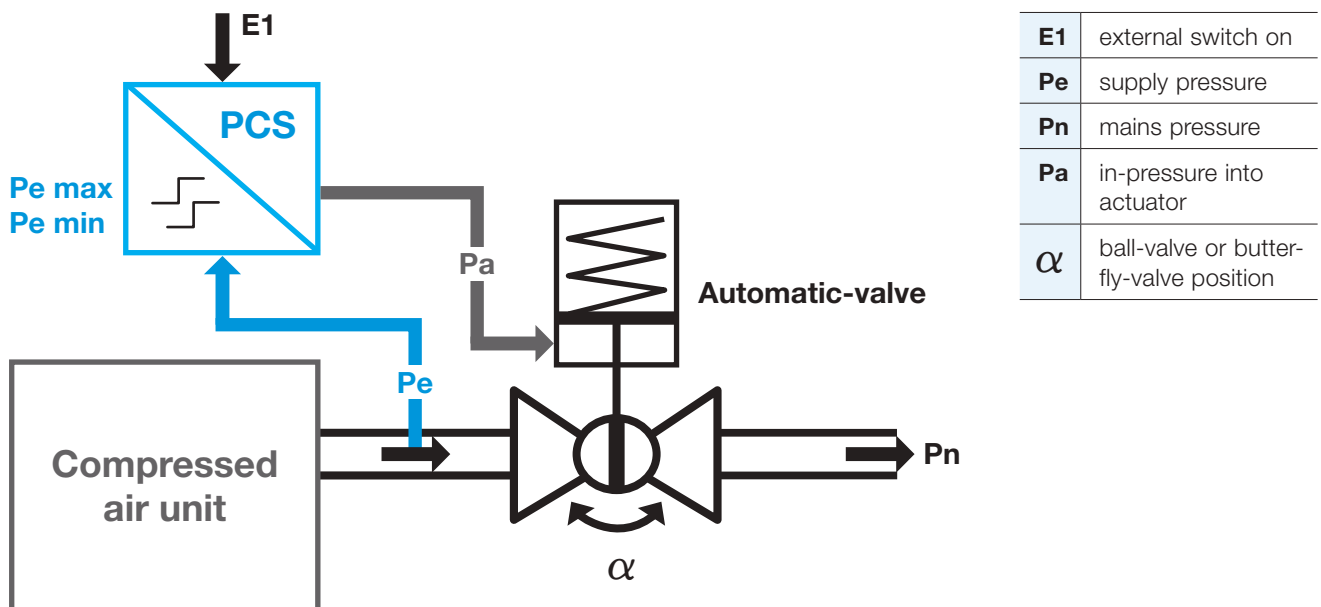
Switching on-off a compressed air unit in a compressed air supply generally takes place with an automatic valve (ballvalve or butterfly valve).

If air is released from the stored large-volume compressed air supply, and when the compressed air unit is activated, there is a considerable reduction of incoming pressure, because the volume flow of the compressed air unit does not correspond to the actual compressed air requirement. This situation can lead to overloading at the compressed air unit.

Air-main charging systems such as PCS ensure

- optimum running-up of compressed air supplies
- protection for the compressed air servicing unit in case of overloading
- on-going operation.

Plant layout



The electro-pneumatic control unit PCS coordinates the functional sequence of the OPEN and/or CLOSE movement of the cut-off valve, depending on the supply pressure of the compressed air servicing unit in the compressed air supply.

Automatic running-up and pressure guarantee are differentiated according to their type of operation:

Type: PCS-...-Q
automatic pressure guarantee „Secure Quality“

Type: PCS-...-V
automatic pressure guarantee „Secure Supply“

Types of operation – PCS

The automatic air-main charging system protects the compressed air servicing unit when there is too low pressure in the mains supply (for instance due to leakages in the system, the system can be deflated).

Too low operating pressures can arise when starting the station and/or in the case of too high air consumption. In this case the valve closes (rotary actuator with ball-valve or butterfly-valve).

PCS-...-Q „Secure quality“

The valve also closes in case of loss of voltage and existing operating pressure.
In the case of loss of voltage supply, there is a „manual override“ for the air-main charging system.

Secure compressed air quality		
Voltage	Pressure	PCS-...-Q
0	0	closed
0	1	closed
1	0	closed
1	1	open

Voltage	0 = no voltage 1 = voltage present
Pressure	0 = pending pressure is less 1 = pending pressure is more than setting

PCS-...-V „Secure supply“

The air-main charging system remains open in case of voltage loss and still existing operating pressure.

Secure compressed air supply		
Voltage	Pressure	PCS-...-V
0	0	closed
0	1	open
1	0	closed
1	1	open

Pressure	1 = pending pressure is more than spring-force of the actuator at approx. 3.5 bar
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PCS – the electro-pneumatic control unit

The electro-pneumatic control unit PCS is constructed in a specially developed cast-metal casing for implementing bar-vacotrol® solutions, and is mounted directly onto the actuator actubar®.

All function-related subassemblies are mounted in and around the casing:



- binary end position sensors „open“ or „closed“
- valve block for switching the rotary actuator actubar®
- a circuit board with function control and the necessary connecting interface
- an additionally visible mechanical position indicator

The compact infeed terminal block is connected to the front of the control unit and consists of:

- pressure regulator for supply to the actuator control
- manometer
- electronic pressure switch

Version PCS-...-Q - „Secure Quality“ has an additional mechanical „emergency manual override“.



Actuator control unit and infeed terminal block are completely and mechanically connected to the automatic air-main charging system PCS.

This automatic air-main charging system PCS is installed free of hoses to the rotary actuator actubar.

The mechanical standard interface at the PCS guarantees connection to all standard rotary actuator with interface 80 x 30 and 130 x 30 according to VDI/VDE 3845.

PCS operating modes

The automatic air-main charging system PCS can be operated in either control or regulating mode.

Technical data

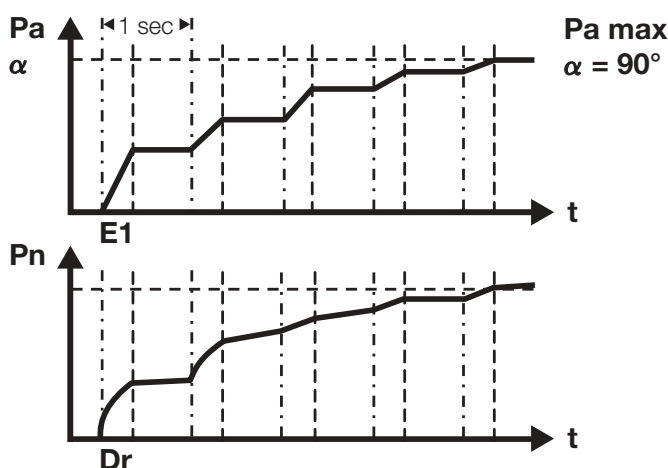
Technical data	
Casing material	cast-Aluminium
Casing dimensions	L x B x T [mm] – 180 x 90 x 75 mm
Protection grade	IP65
Supply voltage	24 VDC
Electrical connection	terminal strip X2 inside casing
Pneumatic port	P (ø 6 mm): operating pressure (comp. air)
Operating medium	filtered and dried air
Supply pressure P_e to P	3 to 10 bar, 3 to 16 bar
Actuating pressure P_a	2 to 8 bar
Pulse width range	in 16 steps adjustable between > 0 to < 1000 ms
Ambient temperature	-10 °C to + 50 °C (under +2 °C consideration for condition of air)

Control mode

In control mode, activating of the actuator or the valve takes place directly dependent on the preset switching point.

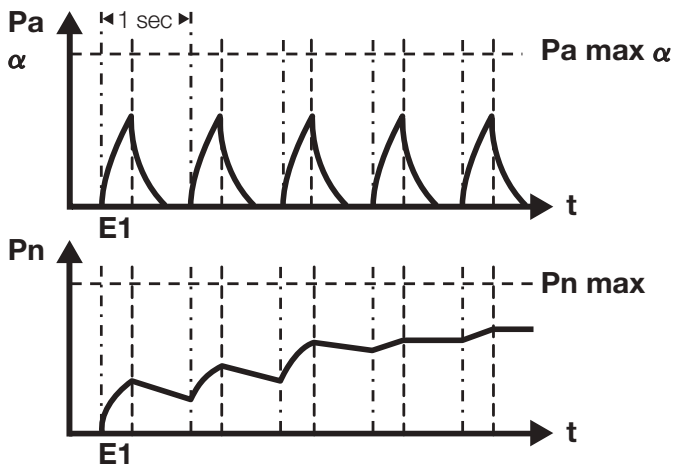
The activating function can take place with a throttle valve and pulsed additionally. The pulse width can be set at a constant pulse frequency of 1 Hz.

Here we differentiate between 2 operating modes:



Stepped filling type S

The actuator and in turn the valve are opened step-by-step with constant frequency and selected pulse width.



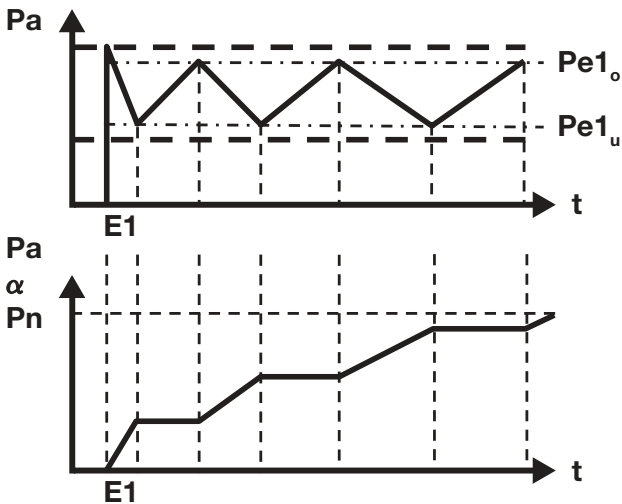
Pressure filling type S

The valve is opened and closed in pulses with constant frequency and selected pulse width.

Regulating mode

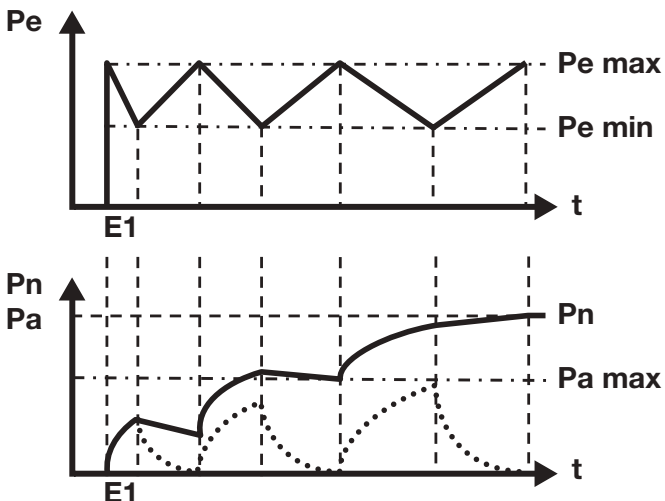
Operation of the actuator and the valve takes place in regulating mode, and dependent on the preset pressure value at the pressure switch. Here the preset hysteresis determines the quality of control.

Here we differentiate between 2 operating modes:



Stepped filling type R

Actuator + valve are opened step-by-step, depending on the preset pressure set value.



Pressure filling type R

The valve is opened and closed in pulses, depending on the preset pressure set value.

The desired version for both types of PCS is determined at the jumper block on the circuit board. This simple method of being able to switch over operating modes enables optimum adaptation of the system to the actual conditions of the individual air-main.

Advantageous combinations of operating mode are possible through process-specific settings of the digital pressure switch.

Product identification PCS (Pressure Control System)

PCS-	U-	Q-	16
Description U = universal – 4 operating modes, E = ECO – 1 operating mode	Version U = universal, E = ECO	Function Q = quality, V = supply	Supply pressure 10 bar / 18 bar

Note

- the automatic air-main charging system PCS-E is available exclusively with the operating mode 2-point valve regulation.
- furthermore, the following installation and setting regulations are valid: PCS-U/E.MvEv.

bar-ICS

A model from the system bar-vacotrol

Control unit for valves with inflatable sealing



Product description

Shut-off valves are used in transport equipment for bulk powder and granulate, whose shut-off mechanism (ballvalve, butterfly or knight-gate valves) is fitted with an inflatable sealing. The OPEN or CLOSED position of the cut-off mechanism is achieved with a pneumatic actuator. In the CLOSED position, an optimum sealing effect is achieved through an inflatable sealing between the valve body and the disc, calotte or knife.

An electro-pneumatic control unit type ICS co-ordinates the functional achievement of the OPENING / CLOSING movement of the shut-off valve and the sealing pressure.

The control unit ICS positively complements the bar vacotrol® family series from bar GmbH, and especially when working together with the pneumatic rotary actuator actubar®, automates complex systems operating around the valve.

Construction

The electro-pneumatic control unit ICS is installed in a cast casing, and was specially developed for implementing bar-vacotrol® solutions, and is mounted directly onto the actuator actubar®. The pneumatic connection between control unit and actuator actubar® is achieved without hoses.

The following function-related subassemblies are installed in and on the casing:

- function block
- multiple valve block
- position indication system
- sequence control unit with connection, operator and display interface

Technical data

Technical data	
Casing material	cast-Aluminium
Dimensions in full	L x B x T [mm] – 265 x 100 x 90 mm
Protection grade	IP65
Electrical connection	to terminal strip X2
Monitoring time	5 – 20 sec.
Operating medium	filtered and dried air
Operating pressure at P	3 to 8 bar
Air capacity at A, B	< 140 NI/min
Air capacity at D	< 150 NI/min adjustable
Deflation of the seal	ICS-U-S: un-throttled against the atmosphere, ICS-U-V: Vakuum > - 0,5 bar, > 20 l/min
Ambient temperature	-10 °C to +50 °C (under +2 °C consideration for condition of air)

Sequence control unit

The sequence control unit is built around a circuit board. Connected on the circuit board are:

- solenoid valve
- pressure switch
- position indication system
and
- the external interface to the terminal strip X2.

Important system conditions are signalled with optical messages on the casing cover:

H1 – open **H2 – closed**
H3 – pressure on **H4 – malfunction**

They are available at terminal strip X2 for external signal processing.

The emergency manual override

open < > closed

is made with switch (touch-key) on the printed circuit board.

System-related times can be set with the following time elements

T1 – monitoring time
T2 – delay time for opening valve
T3 – delay time for closing valve

on the pcb.

Directional valve and function block

The directional valve and function block links

- the valve for power control of the pneumatic rotary actuator and controlling the pneumatically charged sealing.
- the built-in pressure regulator for sealing pressure
- the adjustable pressure switch for detecting the sealing pressure
- the throttle valve for limiting the volume flow to the seal hose-free

via connection and adapter block.

The pneumatic connection interface to the compressed air supply and to the inflatable seal is to be found at the front side of the function block.

Throttle silencers are installed for speed harmonization to the actuator actubar®.

All pneumatic connections have G 1/8" screw-connectors.

Loss of current

The valve closes and the seal stays deflated.

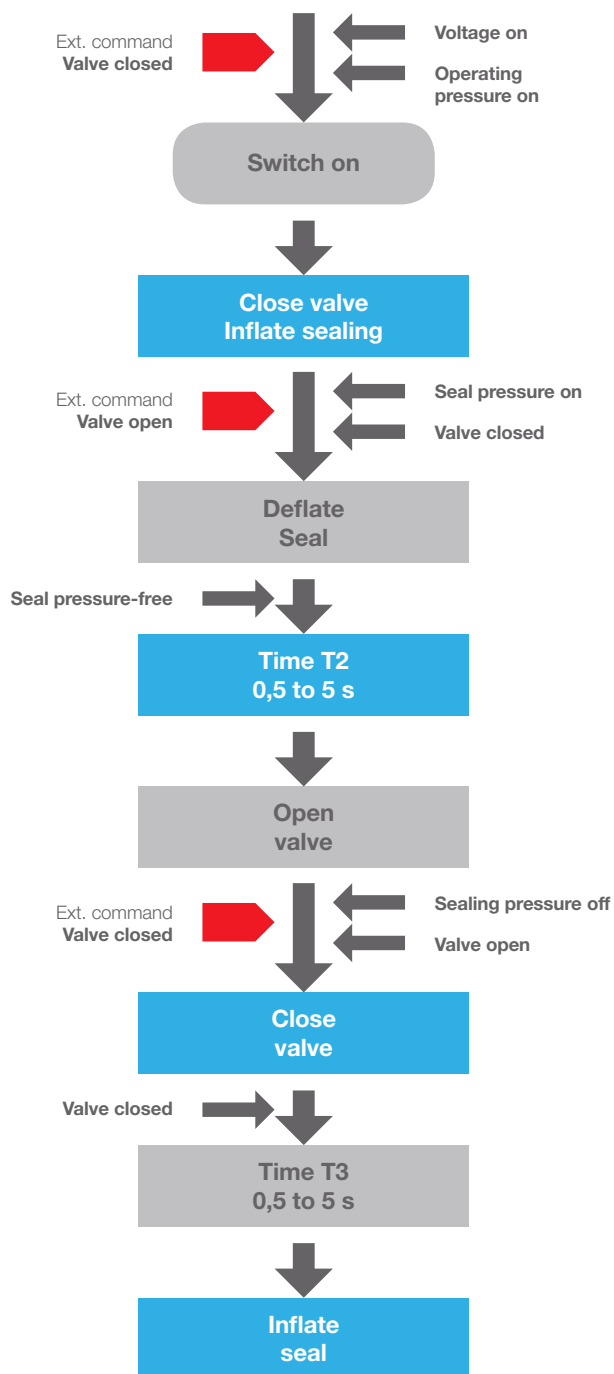
Product identification ICS (Inflate Control System)

ICS-	U-	S-	XXX
Description	Version Universal	Function S = Standard, V= Vacuum	Client-specific version

Note

- an ejector nozzle is activated for the duration of the deflation time T2 in the case of the control unit for valves with inflatable seal and vacuum deflation.
- furthermore, the following installation and setting regulations are valid ICS-U.MvEv.

Function – program sequence



The control unit ASAD implements the program sequence autonomously for automating the valve with inflatable seal.

Switching on

The program ensures that no switch situation appears when switching on, which could lead to destruction of the inflatable seal.

Opening the valve

- position message „closed“ is on, LED display „closed“ illuminates
- command „OPEN valve“ is issued
- inflatable seal is deflated
- when the pressure switch registers that the seal is pressure-free and T2 has finished, the opening movement of the valve is initiated
- situation „open“ is detected via position message „open“ and brought to the LED display

Closing the valve

- position message „open“ is on, LED display „open“ illuminates
- command „OPEN valve“ is deleted externally
- the closing movement of the valve is initiated
- when the position message „closed“ is on, and after completion of T3, the seal is inflated and shown on the LED display as „pressure on“

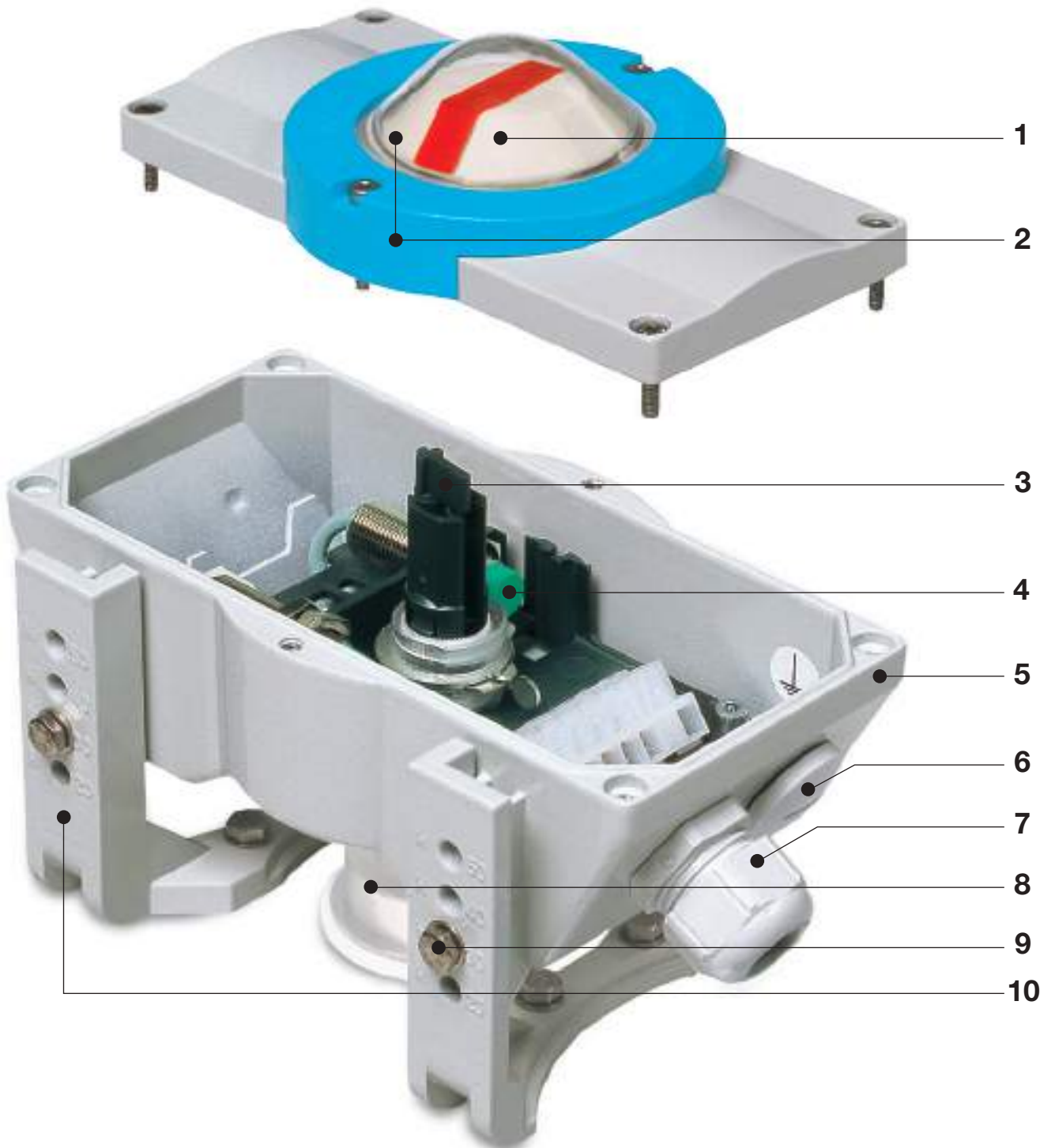
bar-switchcontrol

The robust opto-electric position indicator



The advantages of the bar-switchcontrol at a glance:

Description		Advantages
1	clearly visible position display not only for the OPEN/CLOSED position, but also the flow path	good visibility from far away enables recognition of the flow paths of a 2-way or a 3-way valve
2	ATEX-compliant design via NAMUR switch and special coating of the plastic components	clear recognition of the switching position of valves, even in explosion-protected areas
3	easy and fast adjustment of the switch points	time and therefore cost savings
4	available in various switching configurations	large field of application, even in explosion-protected areas, modular construction, means very short delivery times
5	robust construction: Aluminium die-cast casing	non-sensitive to external impacts
6	optional version with climatic valve to avoid condensed water inside casing	guarantees better service life for the electrical components and prevents corrosion
7	up to four cable entries possible	very simple wiring and afterwards re-wiring of solenoids in the bar-switchcontrol
8	easy access to driving pinion	manual operation of the actuator possible, cost-saving mounting of box
9	adjustable heights of 20, 30, 40 and 50mm to accommodate different pinions	bar-switchcontrol can be mounted to all actuators, being equipped with a signal unit interface according to VDI/VDE 3845
10	universal mounting of the switchcontrol to units with NAMUR size 80 & 130 via interchangeable feet	reduces the number of spare parts to be kept in stock
	precision-bearing on driven shaft	exact switching during the whole life-cycle of the unit
	easy removal of the complete camshaft from the casing	enables easy and rapid servicing
	all components made from corrosion-resistant or corrosion-protected materials	extensively wide field of application



bar-switchcontrol ... imaginative, economical, unique.



The advantages, one by one:
Adjustable height for different pinion lengths with 20, 30, 40 and 50mm.

What's special:

The feet of the bar-switchcontrol can be easily and quickly adjusted in height; exact and safe.

Advantage:

The bar-switchcontrol can be mounted on all makes of actuator which are fitted with a signal unit interface acc. to VDI/VDE 3845.



Universal mounting on NAMUR dimensions of 80 x 30 and 130 x 30mm.

What's special:

The bar-switchcontrol is delivered as standard for 80 x 30 mounting. To change over to 130 x 30, simply exchange the feet.

Advantage:

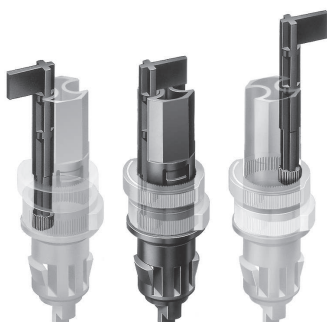
Simplified and reduced storage of spares. Rapid mounting.



The flow paths of the valve are displayed via the red markings, which can easily be adapted to the application.



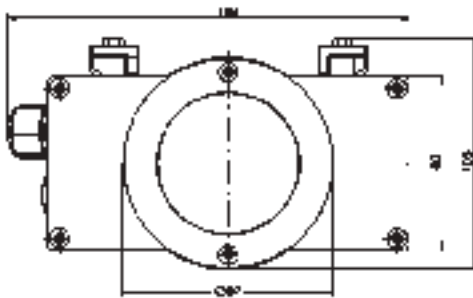
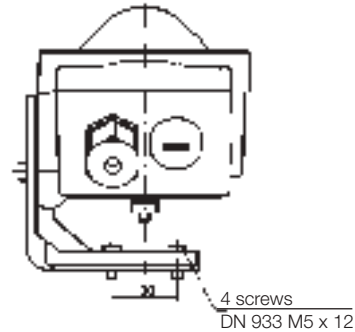
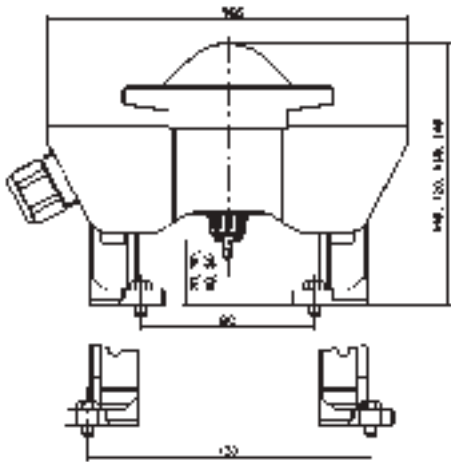
The design of the board enables the mounting of four different types of switches as well as the mounting of the terminal connector block.



Universal actuating cams

The patented actuating cam controls the electro-mechanical or proximity switch. Proximity switches can be operated either damped or undamped. The actuating point is easily and quickly adjusted using the setting tool. Robustness and form play a key role in the connection between actuating cam and shaft which guarantee actuating point stability.

Dimensions



- 1 dimensions 20, 30, 40, 50 via height adjustment of feet
- 2 dimension 130 achieved via exchange of feet
- 3 110 (20), 120 (30), 130 (40), 140 (50)
to accommodate pinion lengths

Technical data

Technical data	
Mounting criteria	according to VDI/VDE 3845 for interfaces 30 x 80 and 30 x 130 (see drawing)
Materials	
Casing parts	Aluminium, resin-coated
Viewing glass	PMMA, anti-static coating for ATEX version
Screws	stainless steel
Blanking plugs and cable glands	PA
Cover	ABS+PC
Protection type	IP67
Temperature range	-20 °C to +70 °C (type SC-M2 as special version for deep temperature applications -40 °C to +70 °C)
Cable gland	M20 x 1,5; clamp range 7–13 mm
Cable	ø 7–13 mm; 2,5 mm ² max.
Weight	0,8 kg
Display and switch range	0 to 180° pivoting angle

Technical details of the bar-switchcontrol variations

Different standard switching types:

What's special: Different types of switches enable modular constructions in ex and non-ex areas.

Advantage: Wide-ranging application possibilities and short delivery times.



Microswitch	type SC-M2
Voltage range	up to 250 V/AC
Permanent current	5 A
Contacts	silver-plated
Switching function	change-over



Proximity round sensor	type SC-D2 (signal „open + closed“)
Voltage range	10–30 V/DC
Operating current I_l	0–100 mA
Idling current I_o	<15 mA
Switching function	PNP normally open

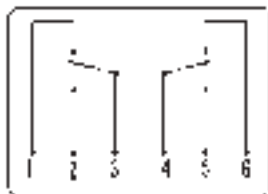


Proximity round sensor NAMUR	type SC-N2 (signal „open + closed“)
Rated voltage U_o	8 V/DC
Current input	damped < 1 mA; undamped > 3 mA
Switching function	NAMUR normally closed, with yellow switching position display (LED)
ATEX marking	Gases: Ex II 2G Ex ia IIB T6-T1 Gb Dusts: Ex II 2D Ex ia IIIB T135°C Db

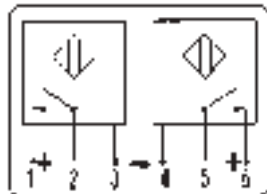


Proximity slot sensor NAMUR	type SC-NS2 (signal „open + closed“)
Rated voltage U_o	8 V/DC
Current input	damped < 1 mA; undamped > 3 mA
Switching function	NAMUR-opener, with yellow switching position display (LED)
ATEX marking	Gases: Ex II 2G Ex ia IIB T6-T1 Gb Dusts: Ex II 2D Ex ia IIIB T135°C Db

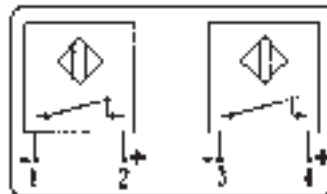
Circuit diagrams



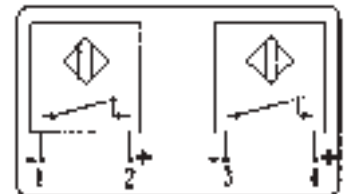
Microswitch
type SC-M2



Proximity round sensor
type SC-D



Proximity round sensor
NAMUR type SC-N



Inductive slot sensor
NAMUR type SC-NS

bar-miniswitch®

With patented self-setting

Our smallest opto-electrical position indicator



Objective

The opto-electrical position indicator bar-miniswitch was especially conceived for smaller actuators. It requires a minimum of space for mounting.

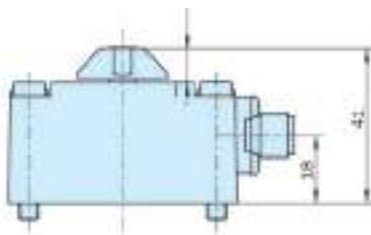
The electrical connections are pluggable. The bar-miniswitch sets the switching point of the end position itself. Therefore it does not need to be opened, either for adjusting or for electrical connection.

One very special feature: a patented system sets the switching point of the end position by itself!

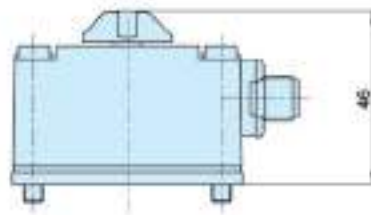
Special features

Description	Benefits
The optimum solution for the smallest of actuators.	Space-saving and harmonious proportions.
Available for mounting sizes 50 x 25 mm and 80 x 30 mm. For pinion extensions 15, 20 and 30 mm.	Flexible usage possibilities.
Available for mechanical and inductive switches.	Wide-ranging application possibilities.
Self-setting switching point of both end positions.	Time and cost savings. Switching points are always correctly set.
Easy-to-read position indicator.	Clearly recognisable flow routes not only with 2/2-way but also 3/2-way valves.
All components made from corrosion-resistant or protected materials.	Usable under a wide range of environments.
Closed, direct mounting.	Protects the drive pinion; compact, space-saving design.
Pluggable, electrical connections with various plug types.	Can be exchanged without professionals.

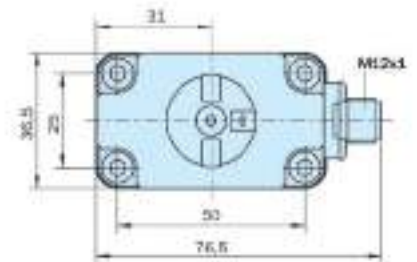
Mounting sizes 50 x 25 mm



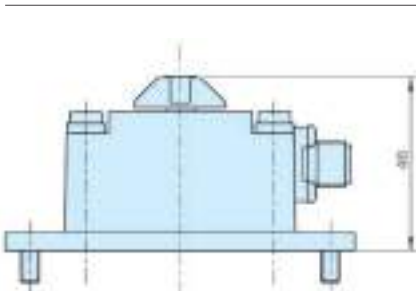
For shaft extension 15
MS-M2-50/25-15 and MS-D2-50/25-15



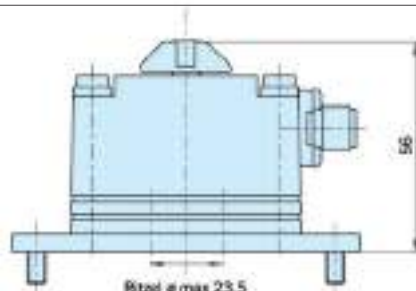
For shaft extension 20
MS-M2-50/25-20 and MS-D2-50/25-20



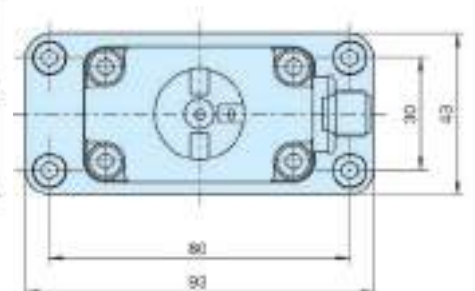
Mounting sizes 80 x 30 mm



For shaft extensions 20
MS-M2-80/30-20 and MS-D2-80/30-20



For shaft extensions 30
MS-M2-80/30-30 and MS-D2-80/30-30





Setting of an end position is no longer needed!



bar-miniswitch + accessories: straight and angled connectors as well as cable connector

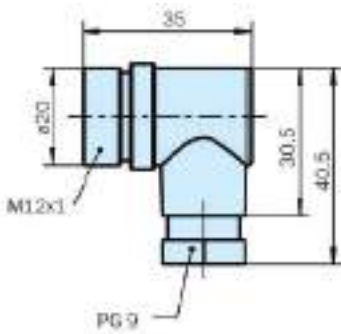


bar-miniswitch ... Mounting size 50/25 mm Shaft extension 15 mm

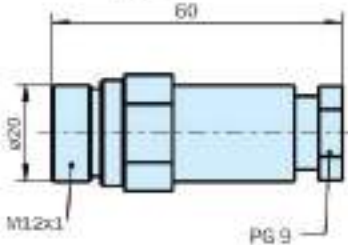


... with 2 distance plates and adapter plate
Mounting size 80/30 mm Shaft extension 30 mm

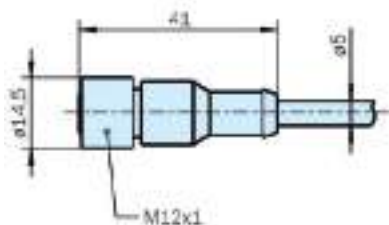
Connectors



Type W12 Connector
with screw terminal angled



Type G12 Connector
with screw terminal straight

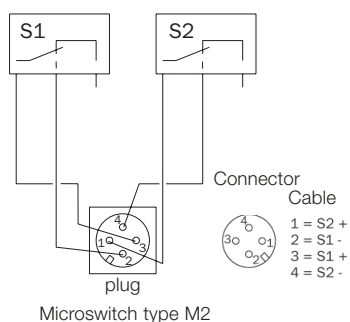


Type K12 Connector
with cable connection (2 m long)

Technical data

Technical data	
Description	compact form, direct-mount
Mounting size	50 x 25 mm, shaft extension 15 mm + 20 mm with adapter: 80 x 30 mm, shaft extension 20 i.e. 30 mm
Constructional features	self-setting, with mechanical microswitches or inductive switches for actuators with 90° pivoting angle; on request for 180° pivoting angle
Mounting position	any orientation
Protection type	IP67
Input voltage	- mechanical: max. 250 V/AC, direct current max. 1 A - inductive: 5 bis 30 V/DC, direct current max. 100 mA
Material	- casing: POM - screws: stainless steel A2
Switching functions	- mechanical: changer - inductive: PNP closer
Ambient temperature	- mechanical: -20 °C to +90 °C - inductive: -20 °C to +70 °C
Connection	plug-connector M12x1, 4-pole DIN EN 61076-2-101
Weight	80 – 130 g, depending on model

Switching diagrams



Ordering code

MS-	M2-	50/25-	15	AW
Type MS	Switch type: M2 = microswitch D2 = inductive, direct-switch	Mounting size: 50/25 or 80/30	Shaft extension: 15 or 20 or 30	Connectors: AW = with screw terminal, angled AG = with screw terminal, straight AK = with cable connection (2 m long)

SWITCHmaster®

The opto-electric position indicator



Opto-electric position indicator for actuators / valves with many advantages

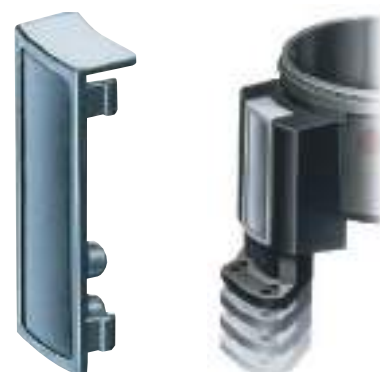
It's got a lot to offer! The patented Switchmaster®. A lot of power and a lot of safety e.g. approx. 50% savings in time and cost for installing and using compared to previous units.

- rapid comfortable connecting of the cable
- switchmaster® opens and closes in seconds
- easy, rapid mounting of the telescopic feet
- easy and rapid adjustment of the switching points
- indication of the valve position recognizable from as far away as 30 m
- clear description of flow path ...
- ... also for 3-way or 4-way valves
- constructional dimensioning prevents wrong mounting
- protection type IP 67 (water-tight)
- no brackets needed
- can be used with all VDI/VDE 3845 classified actuators
- high corrosion resistance and much more – but have a look yourself ...

Clips with double use

Benefit 1: Is the foot set to the correct height, all you do is to press the clip and the height is safely fixed!

Benefit 2: Would you like to have your company logo on the clips? Left and right? Everything is possible!



Removable mounting plate

Disconnecting is easy, because it happens outside the casing:

- remove mounting plate
- thread the cable through the cable gland and connect acc. to the wiring diagram
- clip the plate into position, tighten the fixing screw – finished!



Indication of the valve-position

The green indicator pads are marking the position of the valve-bore respectively of the valve-disc. Just press-on the marker as required.



Position easily recognized from long distances

The display can be easily seen from far and from all sides and clearly indicates the switching position: red = closed green = open. The green marking indicates the flow path.



One foot for all standard dimensions

The foot is always the same: whether left or right, inside or outside. Simply rotate the feet by 180° and the Switchmaster® is ready for NAMUR dimensions of 80 or of 130 mm.

The new generation of position indicator

1 Quick-acting closure

The transparent cap with bayonet socket enables rapid and easy opening/closing for connecting and adjusting.

2 Electromechanical or inductive?

The mounting plate is equipped with either micro-switches or inductive switches – i.e. direct switching or according to NAMUR.

3 Vertically adjustable feet

Depending on the pinion overlap (20, 30, 40, or 50 mm), the Switchmaster® can be universally mounted in seconds. Simply mount the feet (without casing) onto the valve, slide the casing over the feet brackets until the shaft matches the actuator pinion. Then press the clips and the position is fixed. Brackets are not needed!



4 Rapid marking

The flow path of the valve can be easily indicated in seconds by pressing on the green path indicator, not only through valves but multiple valves.



5 Universal switching cams

The patented switching cams activate the electromechanical or inductive switches. Inductive switches can be switched in either damped or undamped situations, depending on the adjustment. The switching point is quickly and easily changed by rotating the integrated adjusting tool. The positive form-fitting connection between cam and shaft guarantees the stability of the switching point.

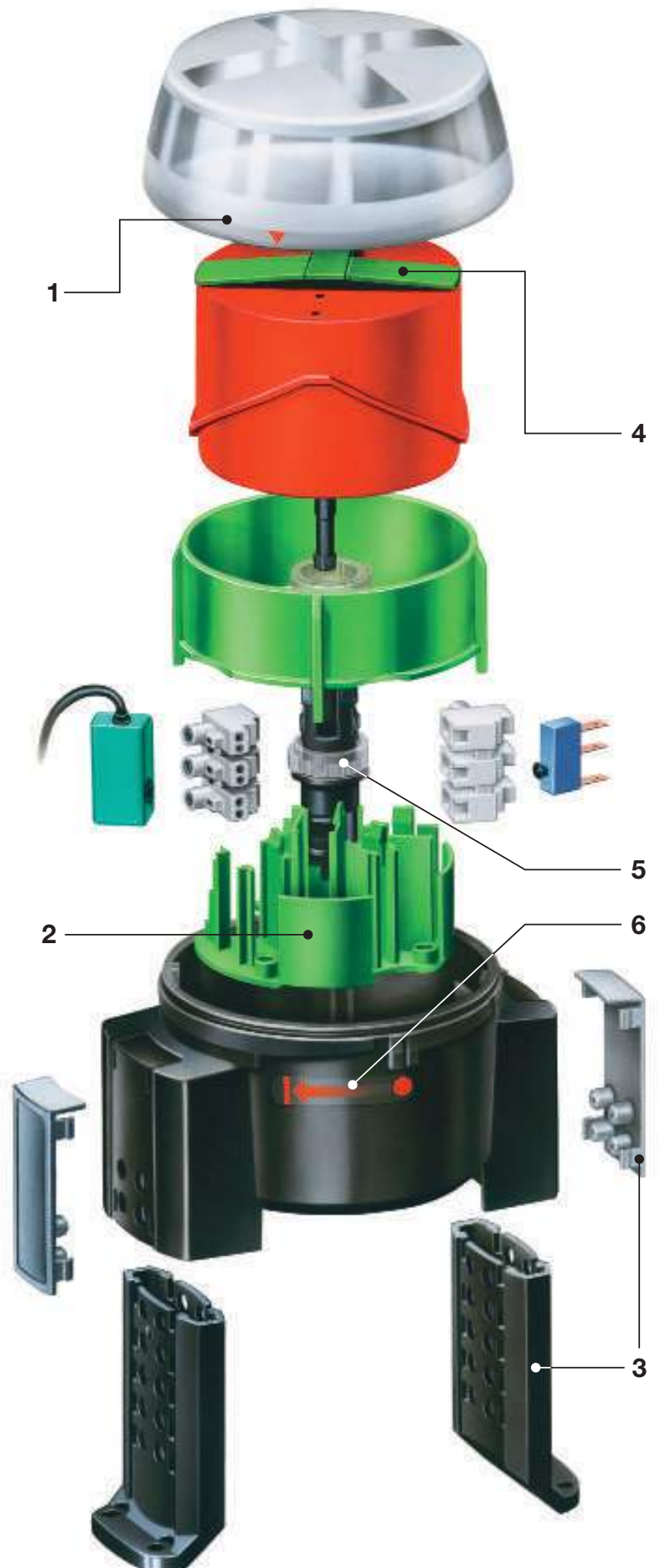


6 Cap markings

Rotate the cap in the closed position and the Switchmaster® is closed water-tight. The quick-acting closure enables connecting, adjusting and programming within seconds.

Highly visible flow paths

When using multiple valves (L or T models), the green marking indicates the flow path. The closed routes are indicated by red markings.



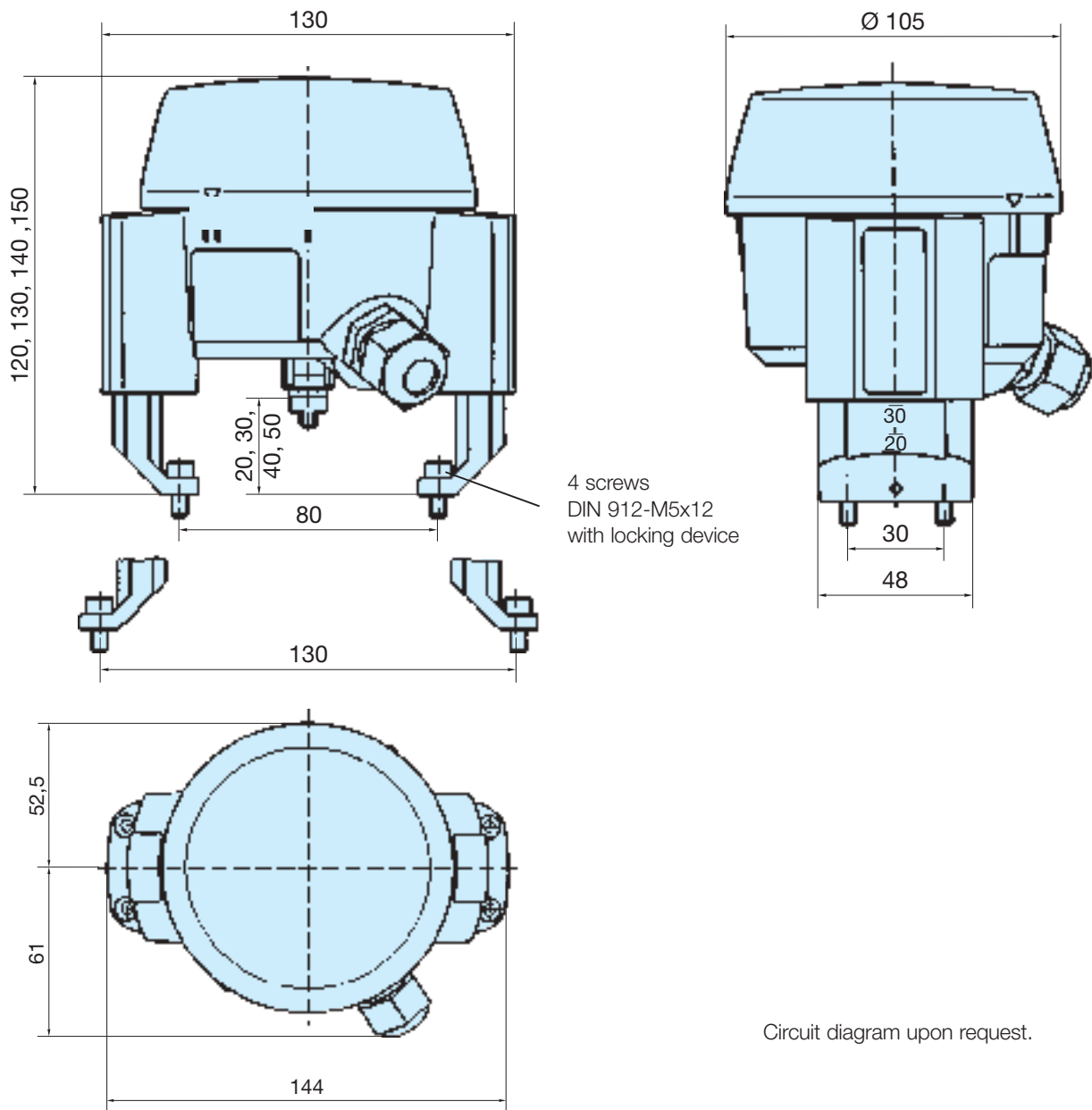
Technical data

Technical data	
Mounting measurements	acc. to VDI/VDE 3845 for flange facing 30 x 80 and 30 x 130 (see drawing)
Materials	
Cap	PC
Stem	POM
Seals	NBR
Cable gland/Nut	PA
Other plastic parts	ABS
Hexagon socket screw	stainless steel (A2-70)
Protection	IP67, VDE 0470/EN 60529
Temperature range	-20 °C up to +70 °C
Display & switching range	0° – 90° pivoting angle
Cable gland	with strain relief, clamp range 7–13 mm
Cable	∅ 7–13 mm, max. 2,5 mm ²
Weight	ca. 0,325 kg

SWITCHmaster®-Variants

SWITCHmaster®-Variants	
Type M, microswitch	type SM - M2 (signal „open + closed“)
Voltage range	4 V/DC–250 V/AC
Current range	1 mA–5 A
Switching function	change-over, contacts gilded
Type D, inductive sensor, direct switching, 3-wire system, with LED	type SM - D2 (signal „open + closed“) type SM - DA (signal „open“) type SM - DZ (signal „closed“)
Voltage range	10 V–30 V/DC
Current range	100 mA
Switching function	plus switching contact in end position damped or undamped
Type N, inductive sensor, Namur ~ DIN 19234/EN 50227 + LED explosion-proofed, EExia IIB T6	type SM - N2 (signal „open + closed“) type SM - NA (signal „open“) type SM - NZ (signal „closed“)
Rated voltage	8 V/DC
Output current	damped < 1 mA, undamped > 3 mA
Switching function	in end position damped or undamped

Dimensions



Circuit diagram upon request.

bar-illuminate

LED-indicator



LED-indicator

For positioner bar-positurn2 and bar positrol®,
 for limit switch boxes type bar-switchcontrol,
 bar-posiswitch, bar-valve&switch

Product description

During important process clearly visible signal lamps are used often to indicate the status of the valve. The standard of optical position indicators are frequently not to recognize depending from lighting conditions and installation position.

Using the supplement bar-illuminate the limit switch boxes will be equipped with a LED circuit board for emitting an adequate signal light corresponding to the position of the valve.

Technical data

Technical data	
In combination with	limit switch boxes: bar-switchcontrol, bar-posiswitch and bar-valve&switch, all without ATEX-Version positioner: bar-positurn2 und bar-positrol®
Colours	red, green, blue
Colour assignment	red = right end position green = left end position blue = center position of 3-position
Operating voltage	24 V DC, this is effective also for the respective sensors of the limit switch boxes
Power consumption	1,0 W
Current consumption	40 mA
Temperature range	min. -20 °C to max. +70 °C for limit switch boxes type bar-switchcontrol, bar-posiswitch, bar-valve&switch -10 °C to +50 °C for positioner type bar-positurn2, bar-positrol®

Chapter 5

Control valves

Pressure amplifier, control valves and accessories at the valve interface



multibar



Control valve type NM-321-H



Control valve type NM-521-H



Control valve type NM-522-H



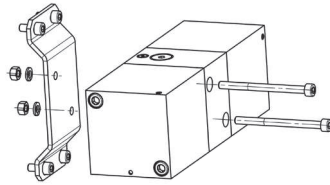
Control valve type NM-532-H



Throttle plate

multi**bar** Pressure amplifier type DV

Product description



multi**bar** with wall fastening
(M-DV-W)

The Multi-bar pressure amplifier doubles the torque of pneumatic actuators. The doubling of available control pressures takes place without additional external energy. For control pressures above 5 bar, the outlet pressure is limited to 10 bar.

One of many application variants:
For operation of the same valve, a smaller (lower cost) actuator can be used.

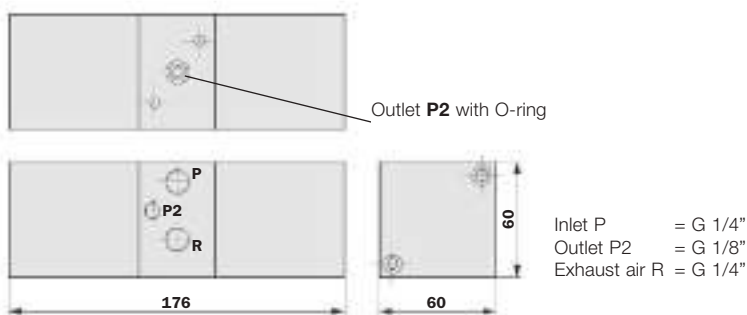
Technical data

Technical data	
Type	pressure amplifier which doubles the existing pressure by a double piston unit with direct switching valve control
Operating method	pneumatic by the energy of the existing control air
Connections: Inlet P Outlet P2	G 1/4" G 1/8" and flange for direct connection of P-connection of a special NAMUR-solenoid valve
Exhaust air R	G 1/4"
Mounting position	any orientation
Control air quality	filtered air regarding residual oil, dust and water according to DIN ISO 8573-1:2010 [7: - :4]
Inlet pressure	2 to 7 bar
Outlet pressure	3 to 10 bar; limited to 10 bar via internal shut-off valve; amplification factor about 1:2
Outlet flow rate	the control air flows to the outlet side virtually unrestricted to the level of inlet pressure P
Control air consumption	for the pressure increase, the same amount of air is consumed as compressed
Positioning time	the positioning time of the actuator with valve does not prolong or only prolong unessentially
Ambient temperature	-20 °C to +80 °C
Materials Casing Seals Pistons Hose pipe	anodized aluminium alloy nitrile-butadiene rubber = NBR (Perbunan) POM (Polyoxymethylene) PVC, fabric reinforced
Accessories	Fitting set for universal connection to NAMUR control valves. NAMUR special valve with fittings. Distributor (4-way) with fixing screws. Fitting set for wall fastening.

Special features

- more economical use of actuators
- operation of up to four actuators with one Multi-bar possible
- saves space due to smaller actuator sizes
- optionally equipped with limit switch boxes, positioners and solenoid valves
- problem solver for changed pressure conditions
- if inlet pressure P reduces, outlet pressure P2 will be kept

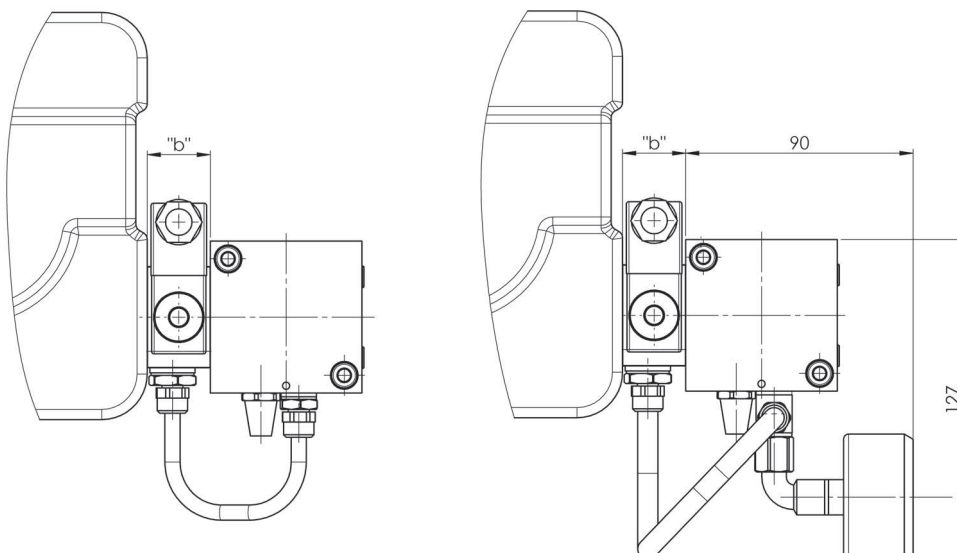
Designation pressure amplifier-DV



Fitting set for universal connection to NAMUR control valves

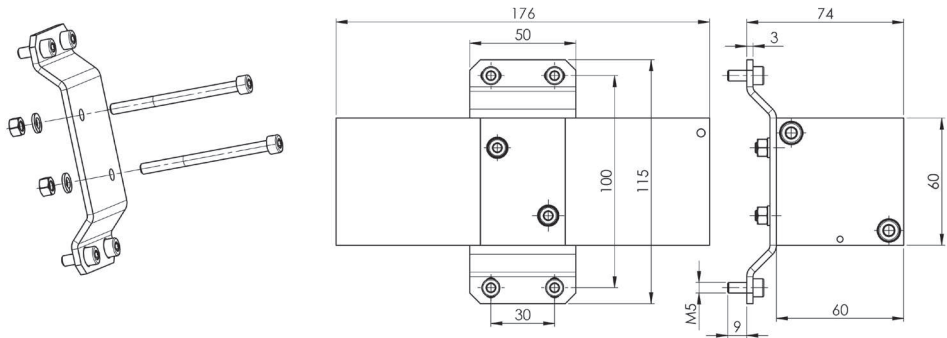
Consisting of:
2 cylinder head screws,
2 male couplings with seals,
hose-pipe, silencer,
(pressure gauge)

Designation	Measure „b“
M-DV-30-O without pressure gauge	30
M-DV-25-0 without pressure gauge	25
M-DV-37-0 without pressure gauge	37
M-DV-U30-M with pressure gauge	30
M-DV-U25-M with pressure gauge	25
M-DV-U37-M with pressure gauge	37



Distributor with fixing screws M-DV-W

Consisting of:
 1 mounting plate,
 2 cylinder screws M5x70,
 2 lock washer,
 2 hexagon nut and
 4 cylinder screws M5x12



Function

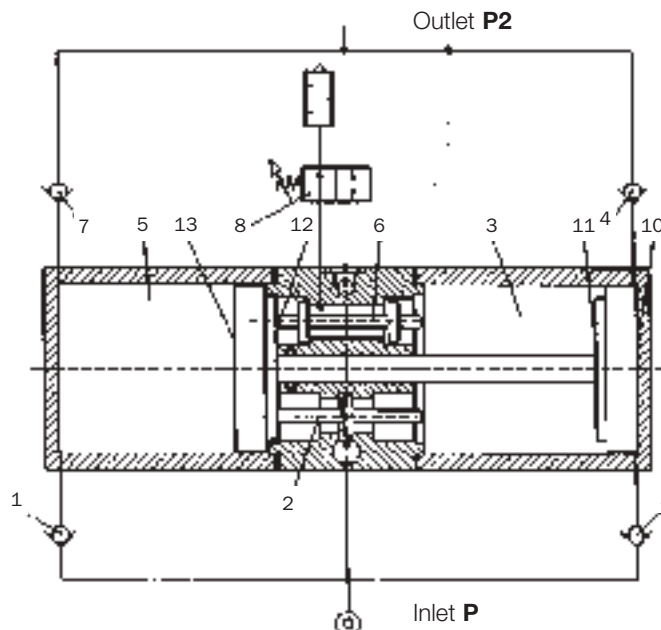
By taking air at the outlet P2 the Multi-bar first will be crossflowed by inlet air P until the outlet pressure P2 is like the inlet pressure P. After it the pressure amplification ensues with the following run of movement and function:

Right limit position:

- The inlet air will be distributed over both check valves (1) and over the valve rod (2) to three piston plains (10, 12 and 13).
- By this the piston rod moves with the pistons to the left, compresses the air of chamber (5) and presses the compressed air through the check valve (7) to the outlet side.
- The air of chamber (3) escapes in doing so through the valve rod (6).
- If the piston has reached the left limit position, the right piston will switch both valve rods (2+6).

Left limit position:

- Now the inlet air will be distributed over both check valves (1) and over the valve rod (2) to the piston plains (10, 11 and 13).
- The piston rod moves with the pistons to the right, compresses the air of chamber (3) and presses the compressed air through the check valve (4) to the outlet side.
- The air of chamber (5) escapes in doing so through the valve rod (6).
- Now the process starts again until either the equilibrium of forces between inlet pressure and outlet pressure is reached (that means, that the air of the outlet side has reached the double pressure than the air of inlet side) or the outlet pressure exceeds 10 [bar] and the valve (8) closes.



3/2-way NAMUR control valve NM-321-H

Product description

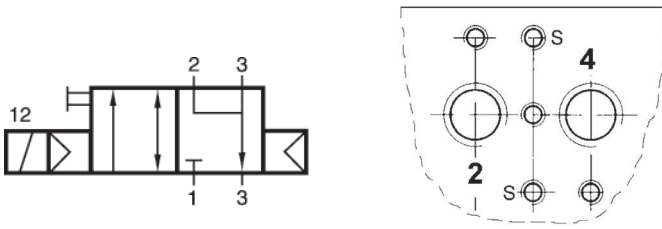


3/2-way NAMUR control valve for driving single-acting rotary actuators. The valve will be supplied assembled to the actuator, but it is also available as single component.

Technical data

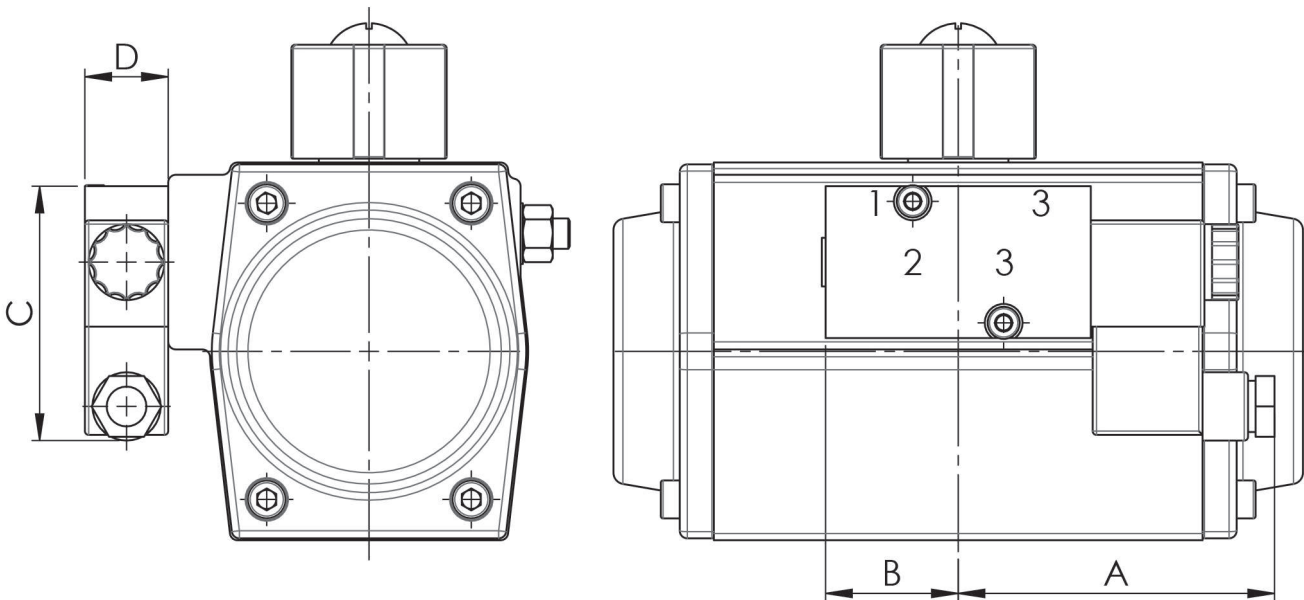
Technical data	
Type	piston slide valve with differential piston (air spring)
Type of connection	flange according to NAMUR, at 2 and 3 G 1/4", at 1 and 3
Nominal width	7 mm
Operating pressure	2 to 10 bar
Temperature range	-20 °C to +70 °C, explosion proofed -10 °C to +50 °C
Protective system, - standard - explosion proof	IP65 nach VDE 0470/EN 60529 with plug for cables ø 6–8 mm; 0,75–1 mm ² EEx m II T4 casted-on with cable, cable length 3,0 m, type: H052V2V-3G1
Operating time	100 %
Materials	casing: aluminium inner parts: brass, aluminium, synthetic seals: NBR (perbunan)
Manual override	standard
Standard voltages and power consumption	standard version: 24 V/DC : 3,0 [W] 230 V/AC: 5,0 [VA] explosion proofed version (EEx m II T4): 230 V/AC: 5,1 [VA] 24 V/DC : 5,0 [W]
Characteristic features	Fastening screws, code pin and seals belong to delivery range. Valve contains an internal exhaust air recirculation (connections 3, side of actuator and line). Exhaust air throttling at connection 3 is only allowed with throttle-plate type NDPE! Order designation for throttle-plate type NDPE please request separately.

Flange picture at actuator acc. to NAMUR recommendation



Drillings „S“ are provided for code thread pin that rises in a deepening of control valve. The code pin ensures attitude controlled coordination of valve connections in case of exchange.

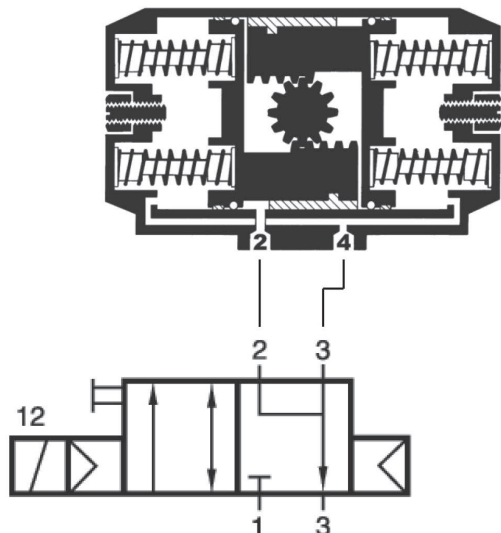
Dimensions



Valve version	Connection thread	DN	A	B	C	D
Standard	1/4"	7	99	35	67	22
explosion proof	1/4"	7	99	35	67	22

Standard mounting of valves

Spring space of actuator is ventilated and deaerated by connection 3 of control valve




Information about mounting at rotary actuators

Normally mounting is done as above and as shown in picture 1 and 2. (Drive in basic position, piston inwards.)
A differing assembling has to be agreed on, especially at complete mounting on valves.

Versions

Standard version	One sided electrically actuated	
Designation	DN	Operating pressure [bar]
NM-321-H-230/AC	7	1,5 bis 10
NM-321-H-24/DC	7	1,5 bis 10
NM-321-H-XX/XX	7	1,5 bis 10

Explosion proof  (EEx = explosion protection EEx m II T4)	One sided electrically actuated	
Designation	DN	Operating pressure [bar]
NM-321-H-230/AC-EEX	7	1,5 bis 10
NM-321-H-24/DC-EEX	7	1,5 bis 10
NM-321-H-XX/XX-EEX	7	1,5 bis 10

xx/xx = Special voltage, please indicate designation with voltage

Other valve types on request.

Explosion proof EEx ia II C T6 on request

5/2-way NAMUR control valve NM-521-H

Product description

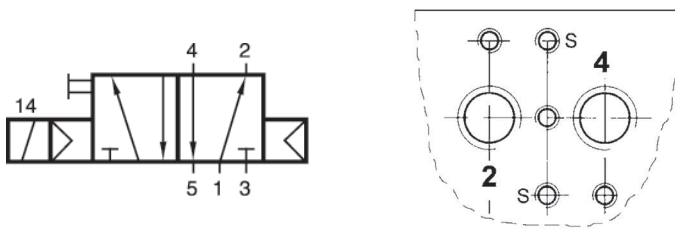


5/2-way NAMUR control valve for driving double-acting rotary actuators. The valve will be supplied assembled to the actuator, but it is also available as single component.

Technical data

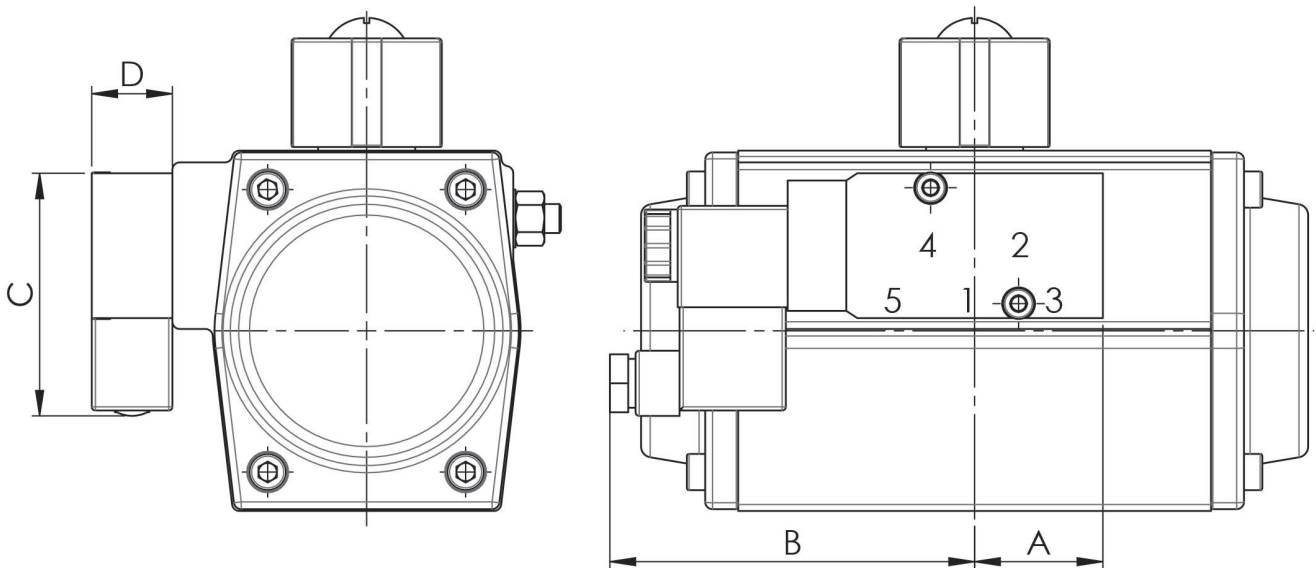
Technical data	
Type	piston slide valve with differential piston (air spring)
Type of connection	flange according to NAMUR, at 2 and 4 G 1/4", at 1, 3 and 5
Nominal width	7 mm
Operating pressure	1,5 to 10 bar
Temperature range	-20 °C to +70 °C, explosion proof -10 °C to +50 °C
Protective system, - standard - explosion proofed	IP65 nach VDE 0470/EN 60529 with plug for cables ø 6–8 mm; 0,75–1 mm ² EEx m II T4 casted-on with cable, cable length 3,0 m, type: H052V2V-3G1
Operating time	100 %
Materials	casing: aluminium inner parts: brass, aluminium, synthetic seals: NBR (perbunan)
Manual override	standard
Standard voltages and power consumption	standard version: 230 V/AC: 5,0 [VA] 24 V/DC : 3,0 [W] explosion proof version (EEx m II T4): 230 V/AC: 5,1 [VA] 24 V/DC : 5,0 [W]
Characteristic features	Fastening screws, code pin and seals belong to delivery range. Throttling of exhaust air possible at connection 3 and 5. Order designation for throttles types SDR and FDS please request separately.

Flange picture at actuator acc. to NAMUR recommendation



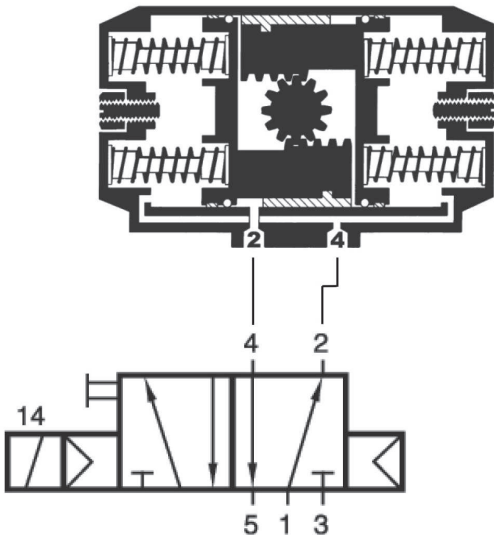
Drillings „S“ are provided for code thread pin that rises in a deepening of control valve. The code pin ensures attitude controlled coordination of valve connections in case of exchange.

Dimensions



Valve version	Brand	Connection thread	DN	A	B	C	D
standard	bar	1/4"	7	35	99	67	22
explosion proof	bar	1/4"	7	35	99	67	22

Standard mounting of valves




Information about mounting at rotary actuators

Normally mounting is done as above and as shown in picture 1 and 2. (Drive in basic position, piston inwards.) A differing assembling has to be agreed on, especially at complete mounting on valves.

Versions

Standard version		One sided electrically actuated	
Designation	Brand	DN	Operating pressure [bar]
NM-521-H-230/AC	bar	7	1,5 to 10
NM-521-H-24/DC	bar	7	1,5 to 10
NM-521-H-XX/XX	bar	7	1,5 to 10

Explosion proof  (EEx = explosion protection EEx m II T4)		One sided electrically actuated	
Designation	Brand	DN	Operating pressure [bar]
NM-521-H-230/AC-EEX	bar	7	1,5 to 10
NM-521-H-24/DC-EEX	bar	7	1,5 to 10
NM-521-H-XX/XX-EEX	bar	7	1,5 to 10

xx/xx = Special voltage, please indicate designation with voltage.

Other valve types on request.

Explosion proof EEx ia II C T6 on request

5/2-way NAMUR control valve NM-522-H

Product description

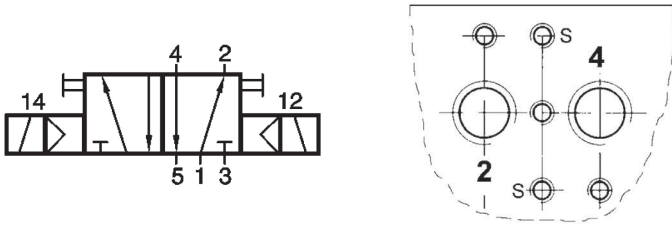


5/2-way NAMUR control valve for driving double-acting rotary actuators. The valve will be supplied assembled to the actuator, but it is also available as single component.

Technical data

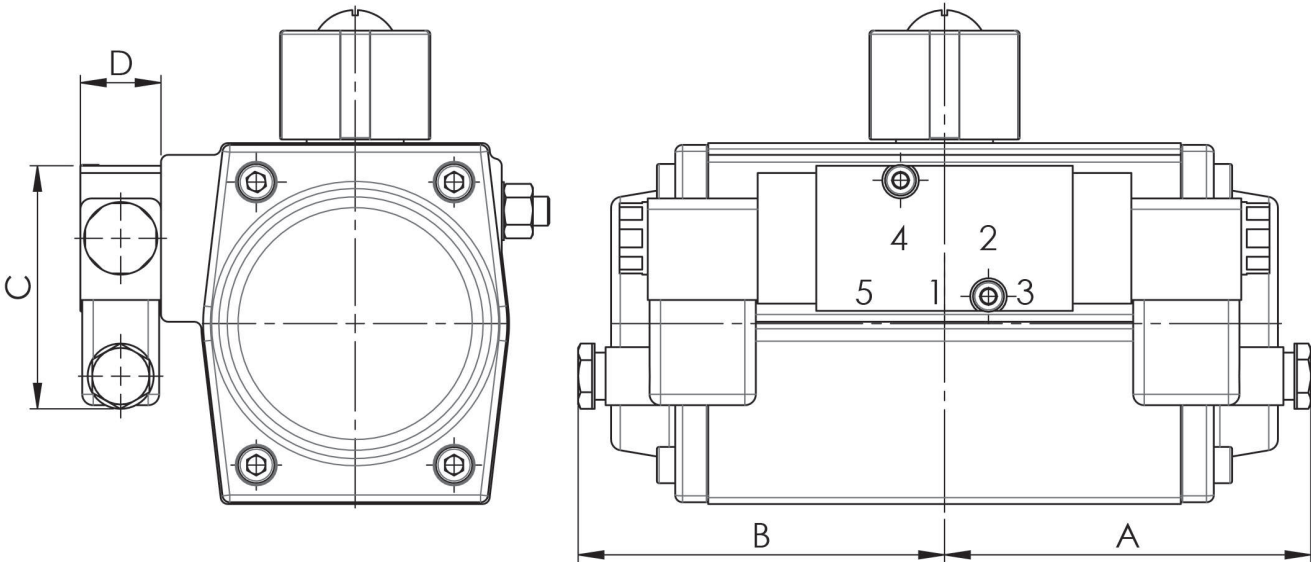
Technical data	
Type	piston slide valve with differential piston (air spring)
Type of connection	flange according to NAMUR, at 2 and 4 G 1/4", at 1, 3 and 5
Nominal width	7 mm
Operating pressure	2 to 10 bar
Temperature range	-20 °C to +70 °C, explosion proof -10 °C to +50 °C
Protective system, - standard - explosion proofed	IP65 nach VDE 0470/EN 60529 with plug for cables ø 6–8 mm; 0,75–1 mm ² EEx m II T4 casted-on with cable, cable length 3,0 m, type: H052V2V-3G1
Operating time	100 %
Materials	casing: aluminium inner parts: brass, aluminium, synthetic seals: NBR (perbunan)
Manual override	standard
Standard voltages and power consumption	standard version: 230 V/AC: 5,0 [VA] 24 V/DC : 3,0 [W] explosion proof version (EEx m II T4): 230 V/AC: 5,1 [VA] 24 V/DC : 5,0 [W]
Characteristic features	Fastening screws, code pin and seals belong to delivery range. Throttling of exhaust air possible at connection 3 and 5. Order designation for throttles types SDR and FDS please request separately.

Flange picture at actuator acc. to NAMUR recommendation



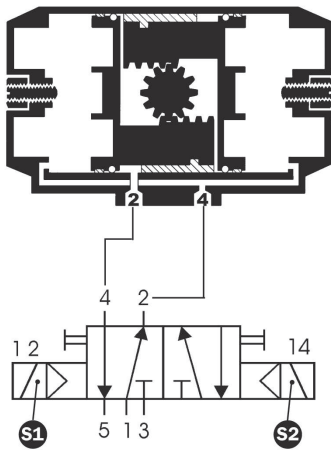
Drillings „S“ are provided for code thread pin that rises in a deepening of control valve. The code pin ensures attitude controlled coordination of valve connections in case of exchange.

Dimensions



Valve version	Connection thread	DN	A	B	C	D
standard	1/4"	7	99	99	67	22
explosion proof	1/4"	7	99	99	67	22

Standard mounting of valves




Information about mounting at rotary actuators

Normally mounting is done as above and as shown in picture 1 and 2 (At drive of coil ❶ actuator in basic position, piston inwards).

A differing assembling has to be agreed on, especially at complete mounting on valves.

Versions

Standard version		Both sided electrically actuated		
Designation	Brand	DN	Operating pressure [bar]	
NM-522-H-230/AC	bar	7	1,5 bis 10	
NM-522-H-24/DC	bar	7	1,5 bis 10	
NM-522-H-XX/XX	bar	7	1,5 bis 10	

Explosion proof  (EEx = Explosion protection EEx m II T4)		Both sided electrically actuated		
Designation	Brand	DN	Operating pressure [bar]	
NM-522-H-230/AC-EEX	bar	7	1,5 bis 10	
NM-522-H-24/DC-EEX	bar	7	1,5 bis 10	
NM-522-H-XX/XX-EEX	bar	7	1,5 bis 10	

xx/xx = Special voltage, please indicate designation with voltage.

Other valve types on request.

Explosion proofed EEx ia II C T6 on request

5/3-way-NAMUR control valve NM-532-H

Product description

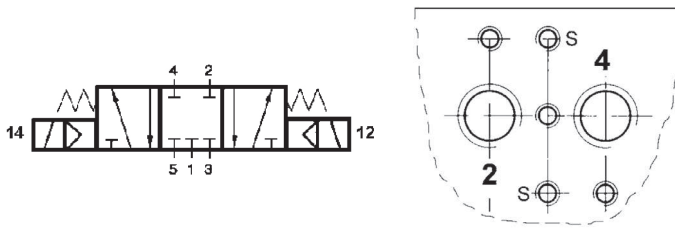


5/3-way NAMUR control valve for driving double-acting rotary actuators. The valve will be supplied assembled to the actuator, but it is also available as single component.

Technical data

Technical data	
Type	Piston valve with pneumatic spring
Connection	Interface acc. to NAMUR, parts 1, 3 und 5: G 1/4"
Nominal width	7 mm
Operating pressure	1,5 bis 10 bar
Temperature range	-10 °C bis +50 °C
Protection class	IP65 as per VDE 0470/EN60529
- standard	with plug for cables \varnothing 6–8 mm; 0,75–1 mm ²
- explosion proof	Ex m II T4 with moulded cable, cable length 3,0 m, type: H052V2V-3G1
Duty cycle	100 %
Materials	casing: Aluminium inner parts: brass, aluminium and synthetics seals: NBR
Manual override	standard
Standard voltages and power consumption	standard version: 230 V/AC: 5,0 [VA] 24 V/DC: 3,0 [W] explosion proof version (EEx m II T4): 230 V/AC: 5,1 [VA] 24 V/DC: 5,0 [W]
Characteristic features	fastening screws, code pin and seals are part of delivery. Throttling of exhaust air possible at connection 3 and 5! Please ask for ordering codes for throttles types SDR and FDS separately.

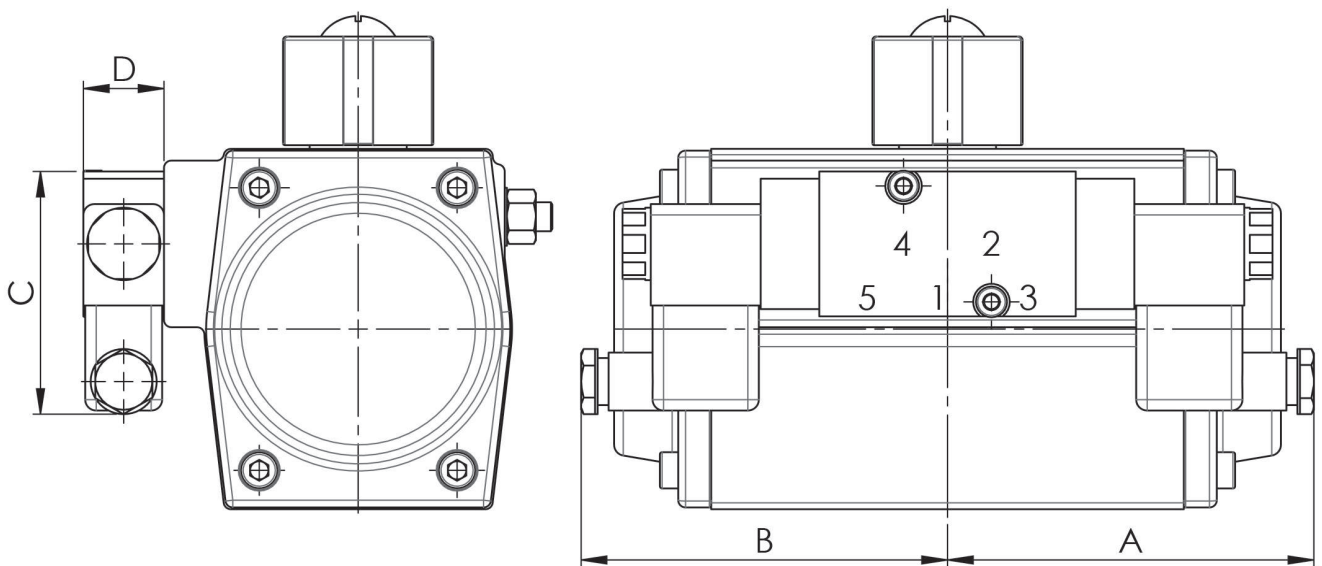
Actuator interface according to NAMUR standard



Threads „S“ used for coding pins, which correspond with the counter-bore in the control valve.

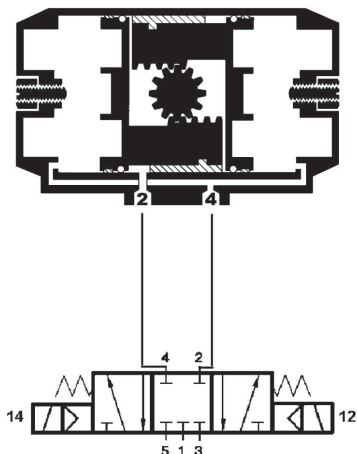
The coding pins avoid permutation of valveconnections in case of exchange.

Dimensions



Valve version	Connection thread	DN	A	B	C	D
standard	1/4"	7	99	99	67	22
explosion proof	1/4"	7	99	99	67	22

Standard-mounting of valve




Information about mounting at rotary actuators

Standard way of assembly is according to the displayed schemes (coil S1 charged actuator in initial position).

Versions

Standard version		
Designation	DN	Operating pressure [bar]
NM-532-H-230/AC	7	1,5 to 10
NM-532-H-24/DC	7	1,5 to 10
NM-532-H-XX/XX	7	1,5 to 10

Explosion proof  Ex m II T4		
Designation	DN	Operating pressure [bar]
NM-532-H-230/AC-Ex m	7	1,5 to 10
NM-532-H-24/DC-Ex m	7	1,5 to 10
NM-532-H-XX/XX-Ex m	7	1,5 to 10

xx/xx = Special voltage, please indicate designation with voltage.

Different valve types on request.

Explosion proof Ex ia II C T6 on request.

Accessories for the valve interface of pneumatic rotary actuators

Throttles, type SDR and FDS (for double-acting actuators)
Throttle plate, type NDPE (for single-acting actuators)

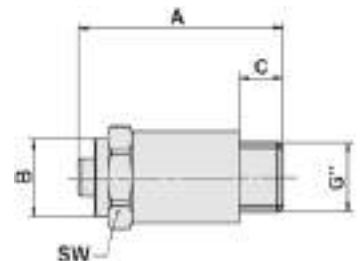
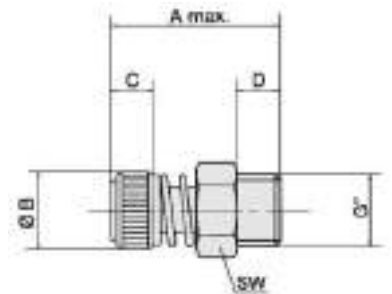
Product description

Throttle silencer for speed regulation type SDR
Fine-throttle with silencer for speed regulation type FDS

Outgoing air throttles type SDR and fine throttles type FDS are screwed in aereating connections of control valves. By throttling outgoing air the slew rate of double-acting actuators depending on control valve can be adjusted independent from each other in both positioning directions. Integrated silencer reduce sounds of air escape.

Throttle silencer for speed control, type SDR						
Connection size	Designation	Dimensions				
		A	ø B	C	D	SW
G 1/8"	SDR - 1/8	26	12	7	6	13
G 1/4"	SDR - 1/4	31	14	7	6	15

Fine adjustment throttle with silencer for speed control, type FDS					
Connection size	Designation	Dimensions			
		A	ø B	C	SW
G 1/8"	FDS - C - 1/8	35,5	10	6	14
G 1/4"	FDS - C - 1/4	38	14,5	8	17



Product description

Throttle plate for single-acting actuators, type NDPE

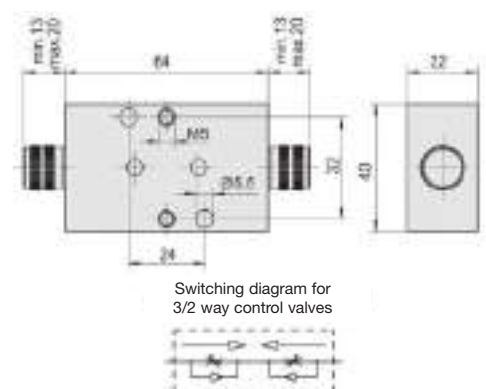
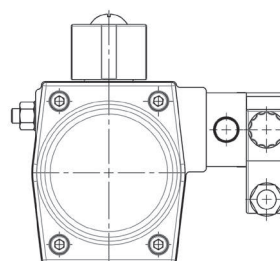
At single-acting actuators it is not possible to adjust positioning speed in both pivoting directions by simple throttles for outgoing air. For this kind of use the throttle plate, type DPE was worked out.

The assembling is done directly between NAMUR connection at actuator and NAMUR control valve.

The opening and closing time of actuator can be adjusted separately by two knurled thumb screws.

Delivery range: throttle plate, 2 NAMUR screws, gasket ring.

Materials: Casing: AlCuMgPb F38, anodized
Sealings: NBR (nitrile rubber)
Inner parts: brass



Chapter 6

Accessories

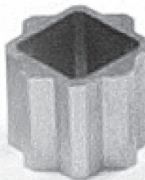
Pressure regulators, manual override gear, reductions and mounting brackets



Pressure regulators,
filter integrated type MW-C



Manual override gear for
bar-actuators type HNG



Accessories for
pneumatic actuators
Reductions, type RED



Mounting brackets

Compressed air conditioning Pressure regulators, filter integrated type MW-C

Product description



The pressure regulator with filter type MW-C is a combination of pressure regulator and air filter.

With the filter pressure regulator the requested operating pressures can be adjusted at consumer independent from admission pressure. Furthermore the impurities bigger than pore depth of oil filter are filtered out of pressure air.

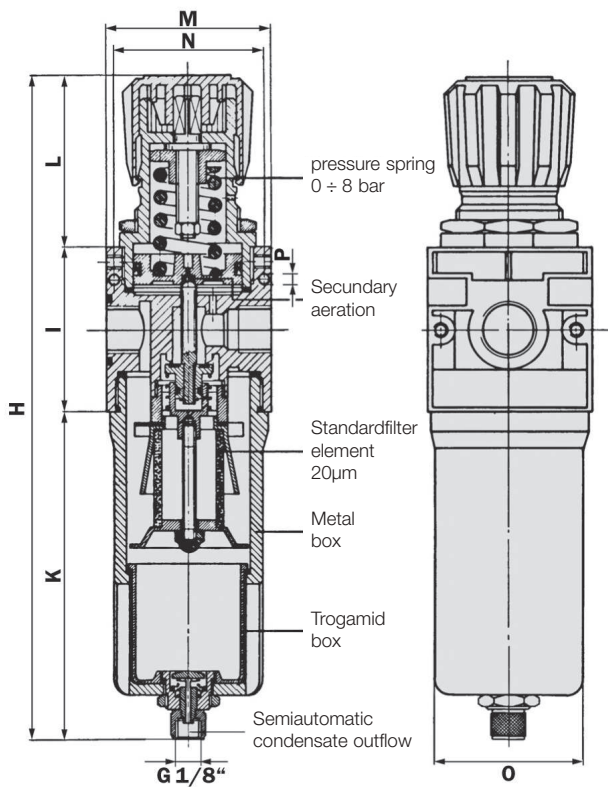
Technical data

Technical data	
Type	compact construction, with integrated fastening drillings
Fixing device	in stiff conduction system or wall mounting
Connection threads	G 1/4", G 1/2"; with reduction: G 3/8"
Mounting position	vertical
Filter operation	standard: 20 µm; on request: 5 or 50 µm
Box content/ max. condensate capacity	construction size A: (1/04") = 10 cm ³ construction size B: (1/02") = 45 cm ³
Kind of operation	piston pressure regulator with secondary aeration
Condensate outflow	standard semiautomatic, on request: fully automatic
Control ranges	standard: 0–8 bar on request: 0–12 bar
Temperatures	min. 0 °C, max. +50 °C at 10 bar
Operating pressure	0 to max. 18 bar
Materials: Casing Box Filter element Outflow valve Inner parts Sealings	zinc diecasting, varnished light metal/plastic (polyamide, glass clear) sintered bronze plastic plastic NBR (buna N)
Flowing-through quantities	1/4" to 1.000 NI/min. 1/2" to 2.000 NI/min.
Weights	see dimension chart

Special features

- compact construction (angle brackets not necessary)
- standard semiautomatic condensate outflow
- protecting cage standard
- sight window of high-grade plastic

Dimensions



Connection thread	H	I	K	L	M	N	O \varnothing	P	Weight (kg)
1/4 - A	190	42	95	46	42	36	38	4,5	0,45
1/2 - B	240	60	118	60	60	52	54	5,5	1,05

Designation

MW-C - 1/4 - A - 20 - H - 0 - 8
 MW-C - 1/2 - B - 20 - H - 0 - 8
 Manometer M-50 0-10 bar G 1/8"

Manual override gear for bar-actuators type HNG

Product description



With the emergency hand actuator type HNG, automatic valves with double and single-acting actuators can be manually operated at any time.

In the case of failure in the air or electricity supply the actuator can be operated by means of a disengageable worm drive with hand wheel.

A mounting kit between actuator and valve does not belong to the delivery package of the emergency hand actuator and is to be ordered separately.

Technical data

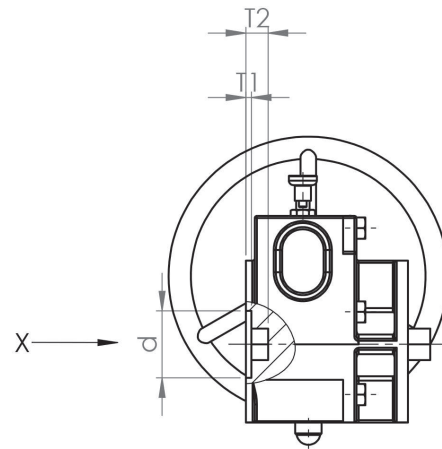
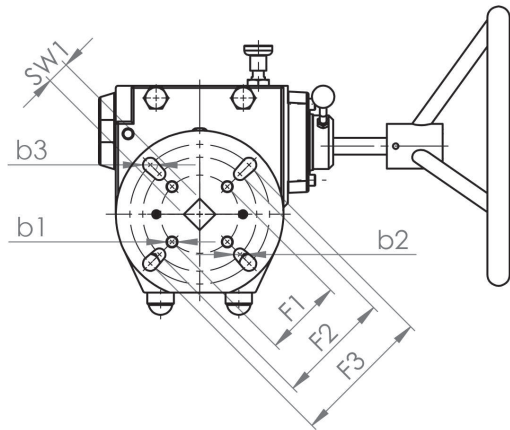
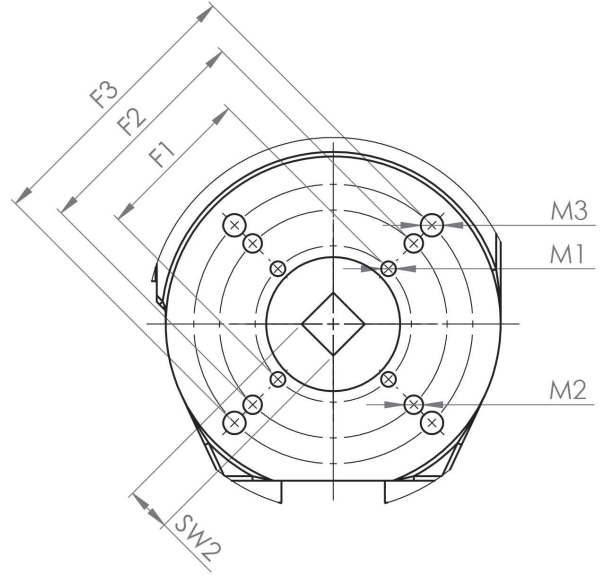
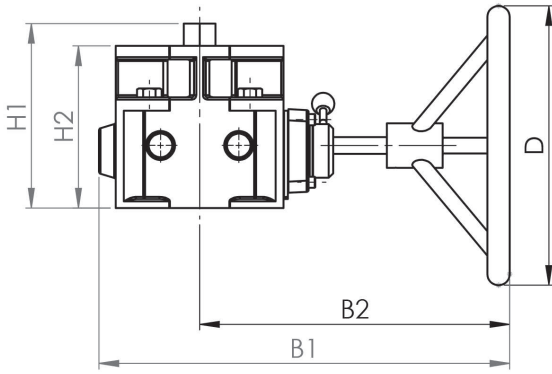
Technical data	
Type	Self-braking worm drive with disengageable worm, Situated between valve and actuator
Sizes	6 versions, suitable for actuator sizes 078 to 300
Pivoting angle	90°
Transmittable torques	prepared for actuator controlling pressure from 3 to 6 bar, for 30 to 4.600 Nm
Control pressure	3 to 6 bar
Gear materials casing hand wheel segment	GG25, painted steel, welded and powder-coated GGG40
Temperature range	-20 °C bis +120 °C
Protection type	IP65
Usage conditions	in compliance with the technical data for standard actuators
Extra options	for other actuators sizes, pivoting angles and controlling pressures

Dimension table

For actuator size	ø A	B1	B2	ø D	H1	H2	ISO F1 / ø d1	ISO F2 / ø d2	ISO F3 / ø d3	ISO G1 / ø e1	ISO G2 / ø e2	ISO G3 / ø e3	SW1	SW2	T1	T2
AD/AS-004 AD/AS-006 AD/AS-008 GD/GS-063	42	295	216	200	140	122	F05 / ø 7	F07 / ø 9	/	F05 / M6	F07 / M8	F10 / M10	14	14	1	46
AD/AS-011 AD/AS-018 GD/GS-075 GD/GS-083 GD/GS-092	42	295	216	200	140	122	F05 / ø 7	F07 / ø 9	/	F05 / M6	F07 / M8	F10 / M10	17	17	1	46
AD/AS-026 AD/AS-037 AD/AS-050 GD/GS-105 GD/GS-125	60	365	275	250	168	145	F07 / ø 9	F10 / ø 11	F12 / ø 13	F07 / M8	F10 / M10	F12 / M12	22	22	4	60
AD/AS-076 AD/AS-110 AD/AS-160 GD/GS-140 GD/GS-160	75	416	306	500	190	162	F10 / ø 11	F12 / ø 13	/	F10 / M10	F12 / M12	/	27	27	4	69
AD/AS-230 GD/GS-190 GD/GS-210	75	416	306	500	190	162	/	/	F14 / ø 17	F10 / M10	F12 / M12	/	36	27	4	69
AD/AS-360 AD/AS-520 AD/AS-240 GD/GS-270 GD/GS-300	102	484	356	600	241	194	F14 / ø 17	F16 / ø 22	/	F12 / M12	F16 / M20	/	46	46	7	97
AD/AS-800 GD/GS-350 GD/GS-400	130	638	478	800	265	209	F16 / ø 22	F25 / ø 17	/	F16 / M20	F25 / M16	/	55	55	6	118

Drawing

Ansicht X 2 : 5



Accessories for pneumatic actuators

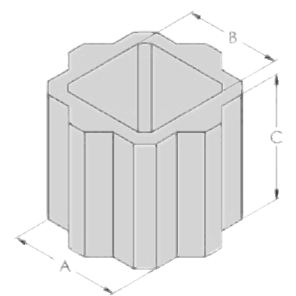
Reductions type RED

Product description

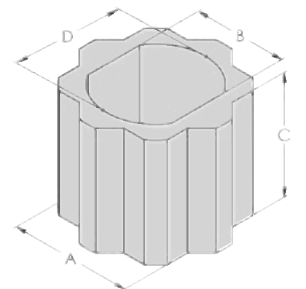
By the reductions inner square or inner double-D in actuator shaft can be accommodated to requested measures.

Material: sintered steel, surface refined

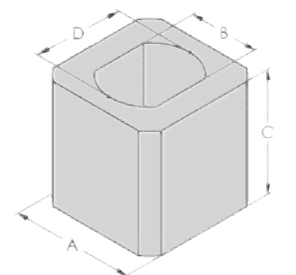
Reductions for actuator shaft with external octagonal/inner square				
For actuator size	Designation	Dimensions (mm)		
		A	B	C
GD/GS-052	RED - A11 / V09	11	9	15
AD/AS-004, -006, -008 GD/GS-063	RED - A14 / V09	14	09	16
	RED - A14 / V10		10	
	RED - A14 / V11		11	
	RED - A14 / V12		12	
AD/AS-011 und -018 GD/GS-075 GD/GS-083 GD/GS-092	RED - A17 / V10	17	10	17
	RED - A17 / V11		11	
	RED - A17 / V12		12	
	RED - A17 / V14		14	
AD/AS-026, -037 und -050 GD/GS-105 GD/GS-125	RED - A22 / V16	22	16	22
	RED - A22 / V17		17	



External octagonal / inner square



External octagonal / internal Double-D

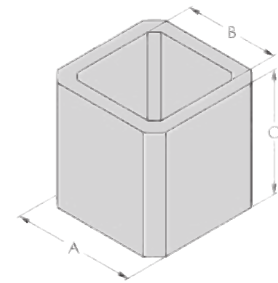


External square / inner double-D

Reductions for actuator shaft with external octagonal, alternatively external square/internal Double-D					
For actuator size	Designation	Dimensions (mm)			
		A	B	C	D
AD/AS-004, -006, -008 GD/GS-063	RED - A14 / Z08	14	8	16	ø 12
AD/AS-011 und -018 GD/GS-075 GD/GS-083 GD/GS-092	RED - V17 / Z10	17	10	17	ø 16

Reductions for actuator shaft with external square/inner square

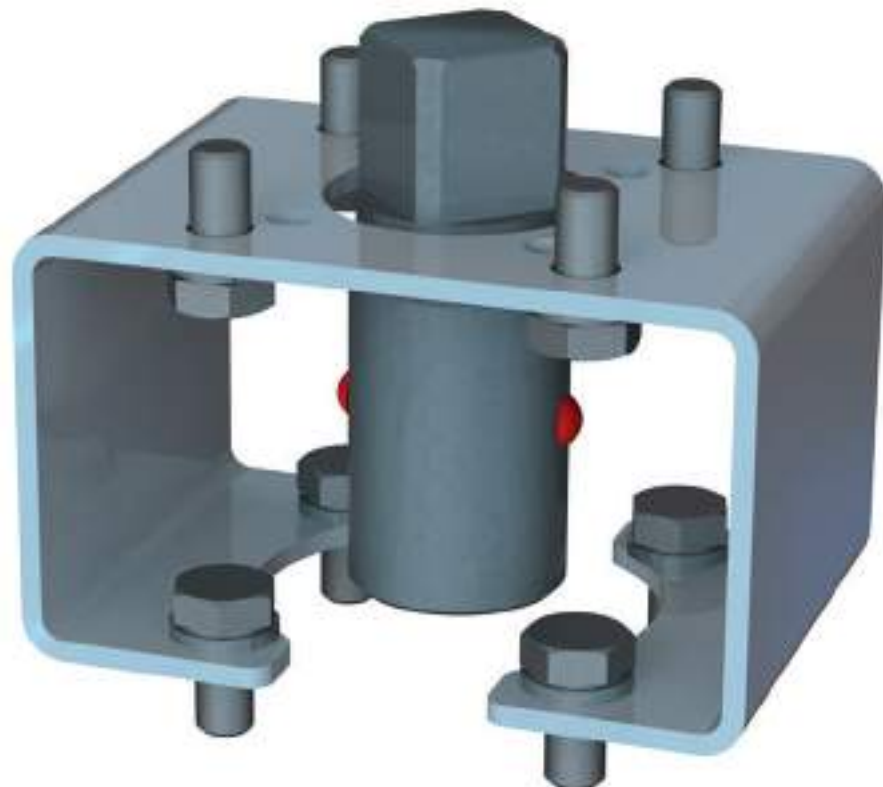
For actuator size	Designation	Dimensions (mm)		
		A	B	C
AD/AS-004, -006, -008 GD/GS-063	RED - V14 / V09	14	9	16
	RED - V14 / V10		10	
	RED - V14 / V11		11	
	RED - V14 / V12		12	
AD/AS-011 und -018 GD/GS-075 GD/GS-083 GD/GS-092	RED - V17 / V10	17	10	17
	RED - V17 / V11		11	
	RED - V17 / V12		12	
	RED - V17 / V14		14	
AD/AS-026, -037 und -050 GD/GS-105 GD/GS-125	RED - V22 / V12	22	12	22
	RED - V22 / V14		14	
	RED - V22 / V16		16	
	RED - V22 / V17		17	
AD/AS-076, -110 und -160 GD/GS-140 GD/GS-160	RED - V27 / V22	27	22	26,5
	AD/AS-230 GD/GS-190 GD/GS-210	RED - V36 / V27	36	27
GD/GS-240 GD/GS-300	RED - V46 / V36	46	36	46



External square / inner square

Mounting bracket

for the individual connection of actuator and valve



MSM-mounting kit consists of:

Part	Standard	On request
Mounting bridge	F03/F05 up to size F30/F25, C-profile or square, stainless steel 1.4301 (A2)	more flange pictures and dimensions on request
Shaft adapter	V09 up to V55 adapted to actuator and valve connections, diameter 20 till 100 mm, stainless steel 1.4305	diverse sizes on request
Fastening elements	for above mentioned flange pictures	versions acc. to sizes

Chapter 7

System solutions
for plant engineering



System solutions for plant engineering



Understanding

You have new ideas. You have developed technologically challenging concepts. For demanding projects and applications which you wish to realise. Simply talk to us. We understand what you want, how you want it; how your ideas may be realised economically.

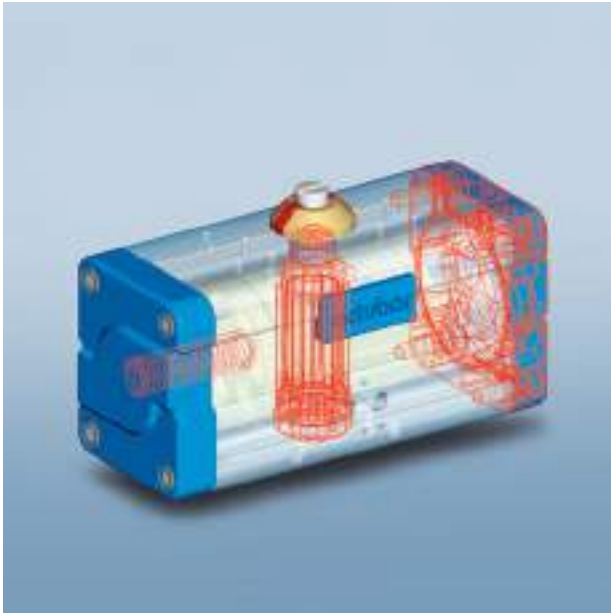
Understanding is the basic prerequisite for the realisation of ideas and goals. Use our competence and our understanding.

Design

You set the tasks. We develop proposals for solutions. Based on the wealth of experience of our highly-qualified employees and the knowledge about what is required and what is important.

We are optimising functions and the cost-benefit-ratio via facility planning, detailed planning and the use of computers.

Until the solution perfectly meets your requirements. Well thought out, sophisticated concepts are the basis for a correct and time- and cost-saving realisation. Use the know-how and the qualification of our specialists.



Development

Innovations are the basis of our successes. Many of our developments have set and influenced trends throughout the world. We are always open to changes and, together with you, we are looking for new ways in order to achieve the maximum benefit for you.

Visions

Our vision is to provide a comprehensive service to our costumers: from the concept to implementation to maintenance. All of this under the aspect of high economic efficiency.



Competence

Internationally, we are one of the leading specialists due to our innovative solutions and more than 25 years of experience in the area of pneumatic and electric swivel drives and automatic valves.

Due to our competence and available capacities in the areas Design and Production, we wish to become your partner for customer-specific system solutions.



Quality and economic efficiency

We realise your system solutions with ideal production conditions. This already begins with the selection of the suppliers, which must meet the quality standards set by us.

Continuing, among others, with components, which must meet our high standards. These conditions in combination with the decades of experience ensure high economic efficiency.



Service

You will receive precise information from us. Until you know every detail. Afterwards, the bar service will be at your disposal.

Our objective: We are at your disposal around the clock. From the service employee to the express supply of spare parts to remote diagnosis.

Service means:

To always be at your disposal even after commissioning. Explaining. Assisting. Place the maintenance in our hand.

Trust

You want security and reliability. We offer you both. We prove what we promised. With services. Solutions. With satisfied customers.

We are at your disposal for further information. Visit us. On the internet. Or – better – request our consultant.

Trust only develops from performance, creativity, flexibility, reliability, cooperation.

Please offers us your confidence in advance: Entrust us with the solution of your task!

Realization

You say Yes to our solutions. We will realise them. Reliably. Professionally. With the entire energy from our consultants and departments Development/Design, Production and Assembly. According to the standard specifications.

Top-class technologies, successful processes and proven components and modules are used for the realisation. Security for you all along the line.



Valve-control-systems

Actuators



Automatic valves



Accessories



Manual valves





Creative solutions

General terms and conditions of sale and delivery

Please have a look to our website www.bar-gmbh.de for latest version.



The descriptions and photographs contained in this product specification sheet are supplied by way of information only and are not binding.
bar GmbH reserves the right to carry out any technical and design improvements to its products without prior notice.

Warranty: All sales and contracts for sale are expressly conditioned on the buyer's assent to bar GmbH terms and conditions found on its website at www.bar-gmbh.de.
bar GmbH hereby objects to any term, different from or additional to bar GmbH terms, contained in any buyer communication in any form,
unless agreed to in a writing signed by an officer of bar GmbH.

bar
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